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Society for Developmental Biology 65th Annual Meeting

University of Michigan, Ann Arbor, MI

June 17–21, 2006

Organizing Committee: Elliot Meyerowitz (Chair), Marianne Bronner-Fraser, Philip Benfey, Judith Kimble

Local Organizer: Cathy Krull

Program abstract number in ***italics***.

Program

Friday June 16, 2006

12 pm–6 pm	**Boot Camp for New Faculty** ***Labs with Model Organisms in Developmental Biology*** **Cathy Krull** – Chair.	**Biomedical Sciences Research Building (BSRB) Room 4515**
1	Labs with model organisms in developmental biology. **C.E. Krull, P.J. Hu, S. Barolo, S.E. Clark**. Univ. of Michigan, Ann Arbor, MI	
6 pm–7:30 pm	**Dinner with SDB Professional Development and Education Committee**	**League—Henderson Room**
7:30 pm–10 pm	**Boot Camp for New Faculty** *Course Design* **Bill Wood** – Chair. University of Colorado-Boulder, CO	**League—Henderson Room**

Saturday June 17, 2006

8 am–12 noon	**Boot Camp for New Faculty: *On the Road to Professorate*** ***Session co-sponsored by Howard Hughes Medical Institute*** **Karen Bennett** – Chair. University of Missouri Columbia	**Union-Kuenzel Rm**
2	Boot Camp for New Faculty *On the road to the professorate* **K.L. Bennett**. University of Missouri, Columbia, MO	
	8:00 Finding and Becoming Great Mentors. **D.R. McClay**. Duke University, Durham, NC	
3	9:00 Optimizing the effectiveness of your personal leadership style using the Myers-Briggs Type Indicator™. **B. Mulay**. University of Michigan, Ann Arbor, MI	
9 am–5 pm	**Satellite Symposium** (non-SDB session) ***The Physiology of Developmental Polarity*** **Michael Levin** – Organizer, Harvard Med. School	**MLB 3**
1–6 pm	**Meeting Registration**	**Michigan League— 2nd Fl Concourse**
3–6 pm	**Poster Session I and Exhibits set-up** Please see Poster Session assignment in the end of the Meeting Program	**Michigan League—Ballroom**

doi:10.1016/j.ydbio.2006.04.439

Poster Session I themes: ***Education, Molecular Medicine and Development, Stem Cells and Regeneration, Cell Proliferation, Cell Motility and Guidance, Gene Regulation, Patterning and Transcription Factors, Morphogenesis, Cell Fate. Late Abstracts.***

7–9 pm	**Presidential Symposium**		**Rackham Auditorium**
4	7:00	Development and evolution of shape. **E.S. Coen**. The John Innes Centre, Norwich, UK	
	8:00	FGF signaling in vertebrate organogenesis: the consequences of too much of a good thing. **G. Martin**. University of California, San Francisco, CA	
9–11 pm	**Opening Reception and Posters/Exhibits Session I** ***Opening reception sponsored by The University of Michigan Center for Organogenesis*** Please see Poster Session assignment in the end of the Meeting Program		**Michigan League—Ballroom**

Poster Session I themes: ***Education, Molecular Medicine and Development, Stem Cells and Regeneration, Cell Proliferation, Cell Motility and Guidance, Gene Regulation, Patterning and Transcription Factors, Morphogenesis, Cell Fate. Late Abstracts.***

Sunday June 18, 2006

8 am–5 pm	**Meeting Registration**		**Michigan League—2nd Fl Concourse**
8 am–8:45 am	**Funding Opportunities in Developmental Biology** **Ida Chow**, SDB – Moderator. Representatives from federal and private agencies.		**Rackham Ampitheater**
9 am–11:45 am	**Concurrent Symposia I** ***Development and Senescence*** **Mahendra Rao** – Chair. NIA/NIH		**MLB 3**
	9:00	Senescence and embryonic stem cells. **M. Rao**, National Institute of Aging, Baltimore, MD	
5	9:30	Germ layer-associated regulatory networks in *Xenopus*. **T.C. Grammer**, **C. Zhang, M.W. Klymkowsky**. Univ. of Colorado, Boulder, CO.; Univ. of California, Berkeley, CA	
6	9:45	Spermatid development is coupled with programmed death of jacket cells in gametophyte of *Marsilea*. **F. Deeb**, **S.M. Wolniak**. Dept. Cell Biology and Molecular Genetics, Univ. of Maryland, College Park, MD	
7	10:00	Dwarf zebrafish, altered bone development, and kidney stone formation in *trpm7* mutants. **M.R. Elizondo**, **E.L. MacDonald, D.M. Parichy**. Inst. of Cell and Molecular Biology, University of Texas at Austin, TX; Dept. of Biology, Univ. of Washington, Seattle, WA	
10:15 am –10:45 am	**Coffee break**		
	10:45	Reproductive senescence and it effects on the brain. **F. Sohrabji**. Texas A and M, TX	
8	11:15	Vernalization: remembering winter with an environmentally induced epigenetic switch. **R. Amasino**. Dept. of Biochemistry, University of Wisconsin, Madison, WI.	
	Novel Genetic Mechanisms in Development **Xue-mei Chen – Chair. UC Riverside**		**MLB 4**
9	9:00	miR172 modulates the output of the AGAMOUS/APETALA2 antagonistic pair in floral patterning. **X. Chen, L. Zhao, Y. Kim**. Dept. of Botany and Plant Sciences, Univ. of California, Riverside, CA; Center for Advanced Biotechnology and Medicine, Piscataway, NJ	
10	9:30	Increased dosage of DSCR1 and DYRK1A on Chromosome 21 destabilizes NFAT regulation and accounts for Down syndrome phenotypes. **A. Polleri**, **I.A. Graef, J.R. Arron, M.M. Winslow,**	

S.K. Kim, T. Miyakawa, U. Francke, G.R. Crabtree. Stanford Univ. School of Medicine/Howard Hughes Medical Inst., Stanford, CA; Kyoto Univ. Faculty of Medicine, Kyoto, Japan

11	9:45	The homeodomain protein MLS-2 regulates multiple aspects of mesodermal development in *C. elegans*. **J. Yuan**, **V. Horner, I. Sultan, J. Liu**. Dept. of Molecular Biology and Genetics, Cornell Univ., Ithaca, NY; Weill Cornell Medical College In Qatar, Doha, Qatar
12	10:00	Differential regulation of Tbx5 nuclear/cytoplasmic distribution during heart development. **H-G. Simon, B. Bimber, T. Camarata, A. Kulisz, T. Chew, J. Yeung**. Dept of Pediatrics and Children's Memorial Res. Ctr, Northwestern Univ. Feinberg School of Medicine, IL
10:15 am–10:45 am	**Coffee break**	
13	10:45	Excision of the mouse Xist gene alters the heterochromatin of the inactive X chromosome and the replication time and DNA stability of both X chromosomes. **Y. Marahrens, S. Diaz-Perez, S. Tsai, D. Ferguson**. Dept. of Human Genetics, UCLA, Los Angeles, CA; Dept. of Pathology, Univ. of Michigan, Ann Arbor, MI
14	11:15	Non-mendelian inheritance of DNA sequence information in *Arabidopsis*. **R.E. Pruitt, S.J. Lolle**. Purdue University, West Lafayette, IN
11:45 am–1:30 pm	**Lunch**	**Union-U Club**
	Posters/Exhibits Session I Please see Poster Session assignment in the end of the Meeting Program	**Michigan League—Ballroom**

Poster Session I themes: ***Education, Molecular Medicine and Development, Stem Cells and Regeneration, Cell Proliferation, Cell Motility and Guidance, Gene Regulation, Patterning and Transcription Factors, Morphogenesis, Cell Fate. Late Abstracts***.

1:30 pm–3:00 pm	**Professional Development and Education Workshop** ***Cool Career Choices in Life Sciences*** **Yolanda Cruz**–Chair. Oberlin Panelists: **S. Gilbert**, Swarthmore College, professor at a liberal arts college **P. Hines**, Science—AAAS, senior editor **R. Williams**, DuPont, scientist in the industry	**MLB 3**
3:00 pm–3:15 pm	**Coffee Break**	**Rackham Lobby**
3:00 pm–3:30 pm	**SDB Business Meeting**	**Rackham Auditorium**
3:30 pm–6:00 pm	**Plenary Session I** ***Genomics and Gene Networks*** **Philip Benfey** – Chair. Duke University	**Rackham Auditorium**
15	3:30	The genomic program for embryonic development: a gene regulatory network analysis of embryogenesis in the sea urchin. **E. Davidson**. CALTECH, Pasadena, CA
16	4:20	A systems approach to nitrogen networks and the "VirtualPlant". **G. Coruzzi, R. Gutierrez, D. Shasha, M. Katari, M. Gifford, K. Birnbaum, C. Poultney**. NYU, Dept. of Biology, Courant Institute, and Center for Comparative Functional Genomics, NY
17	5:10	Synthetic genetic systems as model systems for quantitative studies of genetic regulation.. **A.J. Ninfa**, **A. Mayo, D. Forger, S. Selinsky**. Dept. of Biological Chemistry, Univ. of Michigan Medical School, and Dept. of Mathematics, Univ. of Michigan, Ann Arbor, MI

6:00 pm–7:30 pm **Dinner on the Town** **Vouchers provided**
7:30 pm–10 pm **Posters/Exhibits Session I** **Michigan League—Ballroom**
Poster Session I sponsored by Sinauer and Associates, Publishers
Please see Poster Session assignment in the end of the Meeting Program
Posters tear down at the end of the session

Poster Session I themes: ***Education, Molecular Medicine and Development, Stem Cells and Regeneration, Cell Proliferation, Cell Motility and Guidance, Gene Regulation, Patterning and Transcription Factors, Morphogenesis, Cell Fate. Late Abstracts.***
Session I posters removed at the end of the session

Monday June 19, 2006
8–8:45 am **Exigon Tutorial** **Michigan League—Mendelssohn Theater**
MicroRNA Detection and Function During Vertebrate Embryogenesis
P.B. Antin. University of Arizona, Tucson, AZ
8:45–11 am **Poster Session II set-up** **Michigan League—Ballroom**
Please see Poster Session assignment in the end of the Meeting Program

Poster Session II themes: ***Evolution and Development, Functional Genomics, Cell–cell Signaling, Intracellular Signaling Pathways, Early Embryo Patterning, Organogenesis, Germ Cells and Gametogenesis. Late Abstracts*.**

9 am–11:45 am **Concurrent Symposia II**
Stem Cells in Animals and Plants **MLB 3**
Allan Spradling – Chair. Carnegie Institution.

9:00 TBA. **K. Barton**, Carnegie Institution/Stanford University, CA

18 9:30 SMEDXIN-1: A specific Innexin that regulates Planarian stem cells. **N.J. Oviedo, M. Levin**. Center for Regenerative and Developmental Biology, The Forsyth Institute and Developmental Biology Department, Harvard School of Dental Medicine, Boston, MA

19 9:45 Multiple types of niche control stem cells in *Drosophila* adults. **A. Spradling, B. Ohlstein, M. Buszczak, T. Nystul, L. Morris, E. Decotto**. Carnegie Institution/HHMI, Baltimore, MD 21218; NIH/NICHD, Washington, DC

10:15–10:45 **Coffee break**

20 10:45 Transcriptional regulation of embryonic stem cell pluripotency. **M. Ramalho-Santos, M. Grskovic, C. Chaivorapol, H. Li**. Program in Developmental and Stem Cell Biology, UCSF, CA; Dept. of Biochemistry and Biophysics, UCSF, CA

21 11:00 Stem cell self-renewal, cancer cell proliferation, and aging. **S.J. Morrison**. HHMI and Center for Stem Cell Biology, University of Michigan, Ann Arbor, MI

22 11:30 Stem cells of the integument. **B.A. Morgan, V. Levy, C. Lindon, B. Harfe, Y. Zhang**. CBRC, Harvard Med, Boston MA; University of Florida College of Medicine, Gainesville, FL

Cell–cell Signaling **MLB 4**
Joel Rothman – Chair. UC Santa Barbara

23 9:00 MicroRNA Regulation of Plant Stem Cell Populations. **J.C. Fletcher, L. Eshed-Williams, S.P. Grigg, M. Xie, S. Christensen**. Plant Gene Expression Center, USDA-UC Berkeley, Albany, CA; UCLA, Los Angeles, CA

24 9:30 Chordin is required for neural but not axial specification in sea urchin embryos. **C.A. Bradham, A.J. Poustka, D.R. McClay**. Duke Univ., Durham NC; Max Planck Inst. for Molecular Genetics, Berlin Germany

9:45 Germ layer specification and differentiation in *C. elegans*. **J. Rothman**, UC Santa Barbara, CA

10:15–10:45 **Coffee break**

25 10:45 Bioelectrical controls of morphogenesis. **M. Levin, D. Adams, S. Aw, J. Morokuma, N. Oviedo**. Forsyth Institute/Harvard, Boston, MA

26 11:00 The role of Caudal transcription factors during segmentation of the nervous system and paraxial mesoderm.. **R.K. Ho, I. Skromne**. University of Chicago, Chicago, IL

27 11:30 Zebrafish lacking a functional dispatched 1 display variable craniofacial anomalies in part due to defects in neural crest cell morphogenesis. **S. Ahlgren**, **T. Schwend**. Northwestern Univ. School of Medicine and; Children's Memorial Research Center, Chicago IL

11:45 am–1:30 pm **Lunch** **Union**

Posters/Exhibits Session II **Michigan League—Ballroom**
Please see Poster Session assignment in the end of the Meeting Program

Poster Session II themes: ***Evolution and Development, Functional Genomics, Cell–cell Signaling, Intracellular Signaling Pathways, Early Embryo Patterning, Organogenesis, Germ Cells and Gametogenesis. Late Abstracts*****.**

1:30 pm–3 pm **Concurrent Workshops** **MLB 3**
Grant Writing Workshop
Session sponsored by FASEB/MARC

28 The Fundamentals of Good Grantsmanship. **A.L. DePass**. Long Island University, Brooklyn, NY; Columbia University, New York, NY

Postdoc Symposium **MLB 4**
Isaac Skromne, University of Chicago and **Elizabeth Haswell**, Caltech—Co-Chairs

29 1:30 Two hearts beat as one: Experimental compartmentalization of the *Ciona* heart. **B. Davidson, W. Shi, J. Beh, L. Christiaen, M. Levine**. Univ. of California, Berkeley, CA

30 1:45 A systems approach to understanding N-control of gene networks in the *Arabidopsis* root. **M.L. Gifford, R.A. Gutierrez, K.D. Birnbaum, G.M. Coruzzi**. Dept. of Biology and Center for Comparative Functional Genomics, New York University, New York, NY

31 2:00 *Cdx* determines the spinal cord in zebrafish by preventing rhombomere formation and inducing posterior *hox* gene expression in the caudal CNS. **I. Skromne, D. Thorsen, M. Hale, V.E. Prince, R.K. Ho**. Dept. Org. Biology and Anatomy, The University of Chicago, Chicago, IL

32 2:15 Suppressors of *ibr5*: dissecting auxin and abscisic acid signaling in *Arabidopsis thaliana*. **L. Strader, M. Monroe-Augustus, B. Bartel**. Rice University, Houston, TX

33 2:30 Identification and characterization of novel Wnt responsive genes involved in avian neural crest induction. **L.A. Taneyhill, M. Bronner-Fraser**. Div. of Biology, Caltech, Pasadena CA

34 2:45 Mosaic analysis reveals essential function of FGF receptor 2 in mammary gland branching morphogenesis. **P. Lu, A. Ewald, G. Martin, Z. Werb**. Dept. of Anatomy, UC San Francisco, CA

3:00 pm–3:30 pm **Coffee Break** **Rackham Lobby**

3:30 pm–6:00 pm **Plenary Session II** **Rackham Auditorium**
Evolution of Development
Elliot Meyerowitz—Chair. Caltech

35 3:30 New genetic and genomic tools for the study of floral evolution. **E.M. Kramer, L. Holappa, B. Gould, M. Jaramillo, S. Hodges, J. Borevitz, M. Nordborg, J. Tomkins**. Harvard Univ., Cambridge MA; UC Santa Barbara, CA; Univ. of Chicago, IL; Univ. of Southern California, Los Angelos, CA; Clemson Univ., Clemson, SC

36	4:20	The evolution of plant form: An example from maize. **J. Doebley**. University of Wisconsin, Madison, WI	
37	5:10	Patterning domains in the vertebrate mesoderm. **A.C. Burke**. Wesleyan University, Middletown, CT	
6:00 pm–7:30 pm	**Dinner**		**Union**
6:00 pm–7:30 pm	**Friends of *Developmental Dynamics and genesis* Reception** (non SDB session) Organized by John Wiley and Sons		**Michigan League—Courtyard Garden**
7:30 pm–10 pm	**Posters/Exhibits Session II** Please see Poster Session assignment in the end of the Meeting Program Session II posters removed at the end of the session. Exhibits tear down at the end of the session.		**Michigan League—Ballroom**

Poster Session II themes: ***Evolution and Development, Functional Genomics, Cell–cell Signaling, Intracellular Signaling Pathways, Early Embryo Patterning, Organogenesis, Germ Cells and Gametogenesis. Late Abstracts*.**

Tuesday June 20, 2006

9 am–11:45 am	**Concurrent Symposia III**		
	Pathfinding		**MLB 3**
	Daphne Preuss – Chair. University of Chicago		
38	9:00	Evolution of mating specificity in *Arabidopsis* and its relatives. **D. Preuss**. University of Chicago, IL	
39	9:30	Ephrin-A1 stabilizes growth cone point contacts through phosphorylation of FAK. **S. Woo, T.M. Gomez**. Univ. of Wisconsin Madison	
40	9:45	Commissural axon pathfinding on the contralateral side of the ventral midline in the developing mouse spinal cord. **Z. Kaprielian, S.R. Kadison, S.L. Reeber, J.E. Johnson, F. Murakami, M. Matise**. Albert Einstein College of Medicine, Bronx, NY; UT Southwestern, Dallas, TX; Osaka University, Osaka, Japan; UMDNJ, Piscataway, NJ	
10:15–10:45	**Coffee break**		
41	10:45	A combination of ephrin-As and Neural activity are required for visual system mapping. **D. Feldheim, C. Pfeiffenberger, J. Cang, M. Stryker**. UC Santa Cruz; UC San Francisco, CA	
42	11:00	Molecular basis for pituitary dysfunction: comparison of *Prop1* and *Pit1* mutant mice. **L. Carvalho, R.D. Ward, M.L. Brinkmeier, M. Potok, A.H. Vesper, S.A. Camper**. Dept of Human Genetics, University of Michigan, Ann Arbor, MI	
43	11:15	Regulation of axon fasciculation by Sema3D. **M.C. Halloran, M.A. Wolman**. University of Wisconsin, Madison, WI	
	Beyond Model Organisms		**MLB 4**
	Dina Mandoli – Chair. Univ. Washington		
44	9:00	The role of ARP2/3 and Scar/WAVE complexes in polar growth of the apical cell of the moss *Physcomitrella*. **R.S. Quatrano, P. Perroud, P. Harries, M. Bezanilla, A. Pan, P. Klueh, D. Cove**. Washington University in St. Louis, St. Louis, MO; Samuel Roberts Noble Foundation, Ardmore, OK; University of Massachusetts Amherst, Amherst, MA	
45	9:30	The derived Hox gene zen is required for function, but not specification, of the extraembryonic serosal membrane in *Oncopeltus fasciatus*. **K.A. Panfilio, M. Akam**. Univ. of Cambridge, UK	

46	9:45	Cell or organism? Insights the Mermaid's Wineglass (*Acetabularia acetabulum*), a classic unicellular model, can contribute to modern biology. **D.F. Mandoli**. University of Washington, WA	
10:15–10:45	**Coffee break**		
47	10:45	The origin of vertebrate fin development. **R. Freitas, G. Zhang, M.J. Cohn**. Department of Zoology, University of Florida. Gainesville, FL	
48	11:00	Asymmetry of beta-catenin localization in anterior–posterior cell divisions in the spiral-cleaving polychaete Platynereis. **S.Q. Schneider, B.A. Bowerman**. Univ. of Oregon, Eugene, OR	
49	11:15	Hydra-small animal, big genome, lots of surprises. **R. Steele**. UC Irvine, CA	
11:45 am–1:00 pm	**Lunch**		**Union**
1:00 pm–3:30 pm	**Plenary Session III** ***Pattern Formation in Development*** **Cathy Krull** – Chair. University of Michigan, Ann Arbor.		**Rackham Auditorium**
50	1:00	A systems biology approach to root development. **P.N. Benfey, J. Lee, J. Colinas, H. Cui, R. Twigg, T. Long, J. Dinneny**. Duke University, Durham, NC	
51	1:50	Patterning vertebrate head development. **R. Krumlauf, P. Cambronero, D. Ellies, S. Tumpel, Y. Rao, S. Saunders, L. Wiedemann, P. Kulesa**. Stowers Institute, Kansas City, MO; Northwestern University, Chicago, IL; Washington University, St. Louis, MO	
52	2:40	A gene regulatory network for cell-type patterning in the *Arabidopsis* root epidermis. **J. Schiefelbein, S. Kwak, C. Bernhardt, C. Barron, M. Simon**. Univ. of Michigan, Ann Arbor, MI	
3:30 pm–4:00 pm	**Coffee Break**		**Rackham Lobby**
4:00 pm–6:00 pm	**Awards Lectures** **E.G. Conklin Medal**—Presented by Gail Martin, SDB President-Elect		**Rackham Auditorium**
53	4:00	Regulation of EGFr signaling in *Drosophila* oogenesis. **T. Schupbach, A. Pane, Y. Chen, K. Wehr, M. Klovstad**. HHMI/Princeton University, Princeton, NJ	
		Developmental Biology-SDB Lifetime Achievement Award—Presented by Elliot Meyerowitz, SDB President	
	4:40	Extremes of Axis Formation. **J. Gerhart**, UC Berkeley, CA	
		Viktor Hamburger Outstanding Educator Prize—Presented by Bill Wood, SDB Professional Development and Education Committee Chair	
54	5:20	On Scientific Mentoring and Scientific Teaching: A Tribute to Viktor Hamburger. **R.L. DeHaan**. Emory University, Atlanta, GA	
6:00 pm–7:00 pm	**Meet the SDB Directors Reception for Students and Postdocs**		**Union**
7:30 pm–11 pm	**Awards Reception and Banquet, Entertainment**		**Union**

Wednesday, June 21, 2006

Departure
8 am–3 pm **SDB Board of Directors meeting** **League—Henderson Room**

POSTER SESSIONS ABSTRACTS

Poster Session I

Saturday, June 17, 9–11 pm
Sunday, June 18, 12–1:30 pm, 7:30–10 pm
Numbers in ***italics*** indicate Program Abstract numbers. "B" numbers indicate Poster Board numbers.
Odd Board number authors present posters on Saturday, June 17, 9–11 pm
Even Board number authors present posters on Sunday, June 18, 8–10 pm

Themes: ***Education, Molecular Medicine and Development, Stem Cells and Regeneration, Cell Proliferation, Cell Motility and Guidance, Gene Regulation, Patterning and Transcription Factors, Morphogenesis, Cell Fate. Late Abstracts.***

Education

55 B1 SDB Begins to Create a Developmental Biology Education Database and Joins the BioSciEducation Network Pipeline into the National Science Digital Library. **D.K. Darnell, I. Chow**. Univ. of Arizona Health Sciences Center, Department of Cell Biology and Anatomy, Tucson, AZ; Society for Developmental Biology, Bethesda, MD

56 B2 An in silico first semester freshman laboratory as an introduction to bioinformatics. **R.L. Bennett, T. McGraw, J.B. Keeney**. Juniata College, Huntingdon, PA

57 B3 Mapping student misconceptions using Ed's Tools, an on-line analysis system. **M. Klymkowsky, R. Gheen, I. Doxas, R.K. Garvin-Doxas**. The Bioliteracy Project, U. Colorado, Boulder, Boulder, CO

58 B4 From Bench Top to Presentation in Five Days: DNA Sequencing Research Projects for Summer Workshops or Undergraduate Teaching Labs. **J.A. Emerson, D.I. Ratner**. Department of Biology, Amherst College, Amherst, MA

59 B5 Cloning axon guidance genes: an undergraduate laboratory research module emphasizing developmental genetics, evolution of development, and bioinformatics. **B. Hill, A. Hasley, P. Beach, E. Grunow, S. Clark, M. Duman-Scheel**. Albion College, Albion, MI

60 B6 ***withdrawn***

61 B7 A discovery-based molecular genetics undergraduate lab course using *Caenorhabditis elegans*. **K.L. Chow, J.C. Tang, W.S. Hui, Y.F. Wong, S.W. Choy, S.W. Tsang, Y.M. Lam**. Hong Kong University of Science and Technology, Hong Kong

62 B8 Analysis of the In Vivo Function of the Zebrafish Fragile X Gene Family. **S.L. Olechowicz, J.N. Miller, J.T. Warren Jr**. Penn State Erie, The Behrend College, Erie, PA

63 B9 An undergraduate research module that emphasizes transcription regulation during development. **P. Beach, W. Simanton, M. Duman-Scheel**. Albion College, Albion, MI

64 B10 Stem cell research: An opportunity to engage students in interdisciplinary learning. **J.J. Fernandes**. Miami University, Oxford, OH

Molecular Medicine and Development

65 B11 Interaction between Smad2 and retinoid signaling. **M.H. Festing, K. Keplinger, M.B. Weinstein**. The Ohio State University, Columbus, OH

66 B12 Developmental defects in multiple organ systems in a mouse model of Cornelia de Lange Syndrome. **S. Kawauchi, R. Santos, M. Lopez-Burks, A. Chua, L.M. Kitzes, A.D. Lander, A.L. Calof**,. Department of Anatomy and Neurobiology; Department of Developmental and Cell Biology, Univ. of California, Irvine

67 B13 Contribution of Aberrant Placentation to Fetal Alcohol Syndrome. **G.S. Wolff, P.J. Chiang, S.S. Smith, R. Romero, D. Armant**. Department of OB/GYN, Wayne State University, Detroit, MI; Department of Nutritional Sciences, University of Wisconsin, Madison, WI; Perinatology Research Branch, NICHHD, NIH, DHHS, Bethesda, MD

68 B14 Influence of hormones on growth and differentiation of cells that do not express neurofibromin. **K.F. Barald, T.M. Roth, P. Ramamurthy**. University of Michigan Medical School, Department of Cell and Developmental Biology, Ann Arbor, Michigan

69 B15 Myelin transcription factor 1 is required for islet development and maintenance. **S. Wang, J. Zhang, A. Zhao, G. Gu**. Vanderbilt University, Nashville, TN

70 B16 Reduction of the Wnt inhibitor Dkk1 increases bone density in mice. **B.T. MacDonald, P. Sharma, S. Patntirapong, S.M. Oyserman, R.E. Samuel, X. He, S.A. Goldstein, P.V. Hauschka**. Division of Neuroscience, ChildrenÆs Hospital, Harvard Medical School, Boston, MA; Department of Orthopedic Surgery, Children's Hospital, Harvard Medical School, Boston, MA; Orthopaedic Research Laboratories, Department of Orthopaedic Surgery, Univ

Stem Cells and Regeneration

71 B17 Cooperation of activin, BMP and FGF signals controls mouse incisor epithelial stem cell proliferation. **X. Wang, M. Suomalainen, S. Felszeghy, M.J. James, M.V. Pilkus, C. Chuong, T. Schimmang, I. Thesleff**. Institute of Biotechnology, Univ. of Helsinki, Finland; Present add: Harvard Medical School; Institute of Biotechnology, Univ. of Helsinki, Finland; Univ. of Southern California; Univ.of Hamburg, Germany

72 B18 Skin and hair abnormalities in the rough coat mice. **T. Cao, P. Racz, K.M. Szauter, G. Groma, E. Pankotai, B. Fogelgren, Q. He, K. Csiszar**. Univ. of Hawaii at Manoa, Honolulu, HI

73 B19 Inhibition of mammalian muscle differentiation by blastema extract of S. macrurus. **G.A. Unguez, H. Kim, S. Tapscott**. New Mexico State University, Las Cruces, NM; Fred Hutchinson Cancer Research Center, Seattle, WA

74 B20 Limb regeneration following amputation of chick wing buds suggests additional roles for SHH and FGF. **N. Mishima, C. Pira, S.P. Uraine, K. Oberg**. Loma Linda University, Loma Linda, CA

75 B21 Genechip analysis of Xenopus hindlimb regeneration: comparisons of complete and incomplete stage-dependent regeneration. **M.W. King, M. Grow, A.W. Neff, A.L. Mescher**. IUSM-Terre Haute, Center for Regenative Biology and Medicine; IUSM-Indianapolis, Center for Regenerative Biology and Medicine; IUSM-MSP Bloomington, Center for Regenerative Biology and Medicine

76 B22 *Xenopus* tadpole tail regeneration requires the activity of the proton pump V- ATPase, and proton pumping is sufficient to partially rescue the loss of function phenotype. **D.S. Adams, A. Masi, M. Levin**. The Forsyth Center for Regenerative and Developmental Biology, Boston, MA; The Forsyth Institute, Boston, MA

77 B23 Inhibition of Zebrafish Fin Regeneration Using in vivo Electroporation of Morpholinos Against fgfr1 and msxb. **R. Thummel, S. Bai, M.P. Sarras, Jr., P. Song, X. Zhang, D.R. Hyde, A.R. Godwin**. Center for Zebrafish Research and Department of Biological Sciences, University of Notre Dame, Notre Dame; Department of Anatomy and Cell Biology, University of Kansas Medical Center, Kansas City, Kansas; Department of Molecular and Integrative Physiology

78 B24 Polyamine treatment increases initiation of neurite outgrowth from PC12 cells. **K.L. Boeshore, J.V. Ashurst, M.A. Vella, N. Greczek, Y. Belousov, R. Lucas**. Lebanon Valley College, Annville, PA; Juniata College, Huntingdon, PA

79 B25 Inducible expression of noggin in the mouse subventricular zone: role in development and repair. **M. Morell, K.S. O'Shea**. Univ. of Michigan, Medical School, Ann Arbor, MI

80 B26 Neurogenin 1 expression in mouse embryonic stem cells produces growth factor-sensitive neural progenitors. **M. Velkey, K.S. O'Shea**. University of Michigan, Ann Arbor, MI

81 B27 Response of glial precursors to penetrating embryonic brain injury. **M.M. Domowicz, N.L. Wadlington, J.G. Henry, A. Bond, M.M. Mueller, A.T. Baria, N.B. Schwartz**. Department of Pediatrics, University of Chicago, Chicago, IL

82 B28 Wnt signaling controls proliferation and differentiation of retinal stem cells in zebrafish. **J.R. Meyers, L. Hu, P.A. Raymond**. Univ. of Michigan, Ann Arbor, MI

83 B29 Retina Regeneration Requires Crosstalk Between FGF and Hedgehog Pathways. **J.R. Spence, M. Madhavan, J. Aycinena, K. Del Rio-Tsonis**. Miami University, Oxford, Ohio

84 B30 Light induced photoreceptor degeneration in wild-type pigmented zebrafish. **S.E. Craig, A. Calinescu, E. Dawsey, P.F. Hitchcock**. University of Michigan, Ann Arbor, MI

85 B31 Expression of midline A and B in the zebrafish retina. **A. Calinescu, P.F. Hitchcock**. University of Michigan, Ann Arbor, MI

86 B32 Pten dependence distinguishes hematopoietic stem cells from leukemia-initiating cells. **O.H. Yilmaz, R. Valdez, D.O. Ferguson, S.J. Morrison**. University of Michigan, Ann Arbor, MI

87 B33 Pluripotency versus lineage differentiation of embryonic stem cells. **N. Slawny, A. Chervenak, T. Gratsch, K.S. O'Shea**. University of Michigan, Ann Arbor

Cell Proliferation

88 B34 Insulin-like Growth Factor Signaling Regulates Cell Survival and Cell Cycle Progression in Developing Zebrafish Embryos. **P.J. Schlueter, G. Peng, Y. Li, M. Westerfield, C. Duan**. University of Michigan, Ann Arbor, MI; University of Oregon, Eugene, OR

89 B35 TBX5 is required for embryonic cardiac cell cycle progression. **S.C. Goetz, F.L. Conlon**. Carolina Cardiovascular Biology Center and the Departments of Biology and Genetics, Univ. of North Carolina Chapel Hill

90 B36 Regulation of myocardial growth by FOXO transcription factors. **H.J. Evans-Anderson, K.E. Yutzey**. Cincinnati Children's Medical Center, Cincinnati, OH

91 B37 Mechanisms of caudal truncation in adrenocortical dysplasia (*acd*) mice. **C.E. Keegan, S.P. Shah, M.J. Morley, A.S. Krause**. Univ. of Michigan, Ann Arbor, MI

92 B38 Survival and differentiation of embryonic geniculate and trigeminal ganglia exposed at two stages to BMP-4 and noggin in vitro. **O.L. May, C.M. Mistretta**. University of Michigan, Ann Arbor, MI

93 B39 Differential Regulation of Male and Female Oligodendrocyte Proliferation by Hormones. **M. Swamydas, R.P. Skoff, Z. Zhang, D. Bessert, C. Mullins**. Wayne State University, Dept. of Anatomy and Cell Biology, Detroit, MI

94 B40 Misregulation of oligodendrocyte number in *inxs*^{vu56} zebrafish larvae. **J. Snyder, D. Mawdsley, B. Appel**. Vanderbilt University, Nashville, TN

95 B41 Divergent proliferative roles for Pax3 and Pax7 in chick. **R.S. Kadzik, T.L. Barnes, L.M. Galli, K. Sanders, L.W. Burrus**. SFSU, San Francisco, CA

Cell Motility and Guidance

96 B42 Four Color, 4D Time-Lapse Confocal Imaging of Chick Embryos. **J.M. Teddy, R. Lansford, P.M. Kulesa**. Stowers Institute for Medical Research, Kansas City, MO, USA; Beckman Institute 139–74, California Institute of Technology, Pasadena, CA

97 B43 In Vivo Analysis Reveals A Critical Role For Neuropilin-1 In Chick Cranial Neural Crest Cell Migration. **P.M. Kulesa, R. McLennan**. Stowers Institute for Medical Research, Kansas City, Missouri

98 B44 Cranial neural crest migration from the posterior hindbrain and the role of Ephrin-A5. **C.C. Lu, S.E. Fraser**. California Institute of Technology, Pasadena, CA

99 B45 Dorsal–ventral limb motor innervation choice in influenced by EphB/ephrin-B signaling. **V. Luria, A. Kania, E. Laufer**. Columbia Univ., New York, NY; Institut de Recherches Cliniques de Montreal, Montreal, QC, Canada

100 B46 Regulation of ephrin-A5 during motor axon pathfinding to the hindlimb. **J.S. Lunn, D.L. Turner, C.E. Krull**. University of Michigan, Ann Arbor, MI

101 B47 Ret and EphA4 signaling in motor axon pathfinding. **S.A. Linn, F. Su, L. Knott, E. Kramer, R. Klein, C.E. Krull**. Univ. of Michigan, Ann Arbor, MI; Max Planck Institute of Neurobiology, Martinsried, Germany

102 B48 The Role of B-class Eph Receptors and Ligands on Midline Guidance in the Embryonic Mouse Spinal Cord. **S. Kadison, R. Klein, M. Henkemeyer, Z. Kaprielian**. Albert Einstein College of Med, Bronx, NY; Max-Planck Instit, Martinsreid, Germany; UT Southwestern, Dallas, TX

103 B49 Dishevelled mediates ephrinB1 signalling in the eye field through the planar cell polarity pathway. **I.O. Daar, H. Lee, Y. Bong, K.B. Moore, K. Soria, S.A. Moody**. Laboratory of Protein Dynamics and Signaling, National Cancer Institute-Frederick, Frederick, MD; Department of Neurobiology and Anatomy, University of Utah School of Medicine, Salt Lake City, UT; Department of Anatomy and Cell Biology, The George Washing

104 B50 Frazzled Regulation of Myosin at the Drosophila CNS Midline. **J.N. Talbot, M.F. VanBerkum**. Biological Sciences, Wayne State University, Detroit MI

105 B51 Neogenin interacts with RGMa and Netrin-1 to guide axons within the embryonic vertebrate forebrain. **N.H. Wilson, B. Key**. Univ. of Queensland, Brisbane, Australia

106 B52 Neuropilin 2/semaphorin 3F signaling guides peripheral nervous system segmentation. **L.S. Gammill, C. Gonzalez, M. Bronner-Fraser**. California Institute of Technology, Pasadena, CA

107 B53 Pathological Missense Mutations in Human L1-CAM Are Unable to Rescue Loss-of-function Axonal Pathfinding Defects in Drosophila. **N. Kakanahalli, L.V. Kristiansen, A.K. Skrzynski, E. Bock, V. Berezin, L. Garcia-Alonso, M. Hortsch**. Dept. of Cell and Dev. Biol., Univ. of Michigan, Ann Arbor, MI, USA; Inst. of Mol. Path., Univ. of Copenhagen, Denmark, Inst. de Neurosci., Univ. Miguel Hernandez, San Juan de Alicante, Spain

108 B54 Xdelta-catenin, a Cadherin-Binding Molecule of p120-Catenin Subfamily Required for *Xenopus laevis* Development. **D. Gu, H. Ji, P.D. McCrea**. Program in Genes and Development, UTexas GSBS, Houston, TX; Department of Biochemistry and Molecular Biology, UTexas MDACC, Houston, TX

Gene Regulation

109 B55 Gene Expression in Bovine Clones. **C.S. Smith, D.N. Wells, B. Debbie, B. Sue, P.L. Pfeffer**. AgResearch Hamilton NZ

110 B56 The forkhead factor, FOXL2, regulates expression of the glycoprotein hormone alpha subunit. **B.S. Ellsworth, N. Egashira, D.L. Butts, R.Y. Osamura, S.A. Camper**. Univ. of Michigan, Ann Arbor, MI; Tokai Univ., Isehara, Kanagawa, Japan

111 B57 Functional analysis of a distant 3Æ Bmp2 cis-regulatory region. **R.L. Chandler, K.J. Chandler, D.P. Mortlock**. Vanderbilt University, Nashville, TN

112 B58 Exploring the role of long-range evolutionarily conserved regions (ECRs) flanking Bmp4. **K.J. Chandler, R.L. Chandler, D.P. Mortlock**. Vanderbilt University Medical Center, Nashville, TN

113 B59 The Hand1 Transcription Factor Functions as a Homodimer During Mouse Development. **D. Hu, I.C. Scott, C. Geary, X. Zhao, J.C. Cross**. Genes and Development Research Group, Dept. of Biochemistry and Molecular Biology, University of Calgary, Canada

114 B60 Conserved regulation and role of Pitx2 in situs-specific morphogenesis of visceral organs. **H. Shiratori, M. Shen, H. Hamada**. Osaka Univ. and CREST, JST, Osaka, Japan; Univ. of Medicine and Dentistry of New Jersey Robert Wood Johnson Medical School, Piscataway, NJ

115 B61 Spatio-temporal regulation of *Ngn2* and *Hes1* by Pax3 during murine development. **C.K. Mayanil, H. Nakazaki, A. Reddy, B. Farnell, D. George, E.G. Bremer, D.G. McLone**. CMRC, Dept of Pediatric Neurosurgery and Northwestern University Feinberg School of Medicine, Chicago, IL; Purdue Univ. Hammond, IN

116 B62 Pax6 directly regulates the expression of math5 during retinal ganglion cell differentiation. **M.L. Spencer, A. Riesenberg, N.L. Brown**. Children's Hospital Research Foundation and University of Cincinnati, Cincinnati, OH

117 B63 Regulation of retinal ganglion cell formation: In Vivo analyses of Math5 expression during mouse eye development. **A.N. Riesenberg, T.T. Le, M.L. Spencer, D.C. Blackburn, N.L. Brown**. Children's Hospital Research Foundation and University of Cincinnati, Cincinnati, OH; Northwestern University, Evanston, IL; Harvard University, Cambridge, MA

118 B64 Multiple cell types in the developing zebrafish retina respond directly to retinoic acid. **C.B. Stevens, D.L. Stenkamp**. Univ. of Idaho, Moscow ID

119 B65 Brain regionalization and eye development: A role for GnRH in zebrafish embryo. **S. Wu, L. Page, N.M. Sherwood**. University of Victoria

120 B66 Cre-mediated site-specific recombination in zebrafish embryos. **R. Thummel, C.T. Burket, M.P. Sarras, Jr., B. Sauer, D.R. Hyde, A.R. Godwin**. Department of Molecular and Integrative Physiology, University of Kansas Medical Center; Center for Zebrafish Research and Department of Biological Sciences, University of Notre Dame; Department of Anatomy and Cell Biology, University of Kansas Medical Center; Department of Cell Biology and Anatomy, Rosalind Franklin University of Medicine and Science; Stowers Institute for Medical Research

121 B67 Regulation of Cadherin6B expression by the transcriptional repressor Slug during epithelial-to-mesenchymal transitions in the avian neural crest. **E.G. Coles, L.A. Taneyhill, M. Bronner-Fraser**. California Institute of Technology, Division of Biology, Pasadena CA

122 B68 Developmental and stressor-dependent regulation of corticotropin-releasing factor genes of the South African clawed frog, *Xenopus laevis*. **M. Yao, R.J. Denver**. University of Michigan, Ann Arbor, MI

123 B69 Regulation of SoxB1 genes in neural induction in *Xenopus laevis*. **C. Rogers, T.C. Archer, T. Grammer, E. Silva Casey**. Georgetown Univ., Washington, DC; UC Berkeley, California

124 B70 The POZ-ZF transcription factor xZnf131: Roles in *Xenopus* Neurogenesis and p120ctn/Kaiso signalling? **J.M. Daniel, J. Park, N.S. Donaldson, H. Ji, P.D. McCrea**. McMaster University, Hamilton, Ontario; Univ. Texas MD Anderson Cancer Center, Houston, TX

125 B71 Cloning and functional characterization of GAD67 upstream regulatory regions in *Xenopus laevis*. **C.W. Sipe, D. Solomon, M.S. Saha**. College of William and Mary, Williamsburg, VA; Georgetown University School of Medicine, Washington, D.C.

126 B72 Regulation of Retinal Homeobox Gene Transcription: Implication of Involvement of Forkhead Transcription Factors. **H.E. Moose, L.E. Kelly, R.I. Martinez, H.M. El-Hodiri**. Integrated Biomedical Sciences Program, The Ohio State University, Columbus Ohio.; Center for Molecular and Human Genetics, Children's Research Institute, Columbus Ohio

127 B73 Decoding cis-regulatory sequences involved in coordinate gene expression in Drosophila. **T. Brody, W. Rasband, K. Baler, A. Kuzin, W.F. Odenwald**. Neural Cell-Fate Determinants Section, NINDS/NIH, Bethesda, MD; Office of Scientific Director, IRP, NIMH, NIH, Bethesda, MD

128 B74 ***withdrawn***

129 B75 Transcriptional and post-transcriptional regulation of the nerfin-1 expression during Drosophila neurogenesis. **A. Kuzin, M. Kundu, T. Brody, W.F. Odenwald**. Neural Cell-Fate Determinants Section, NINDS, NIH, Bethesda, MD

130 B76 Analysis of the *D-Pax2 sparkling* enhancer. **C. Rogers, S. Barolo**. University of Michigan, Ann Arbor

131 B77 Identification and Characterization of Groucho as a Component of the Drosophila Knirps Repressor Complex. **S. Payankaulam, P. Struffi, D. Arnosti**. Department of Biochemistry and Molecular Biology, Michigan State University, East Lansing, MI; Department of Biology, New York University, New York, NY

132 B78 Phylogenetic Conservation and Characterization of CtBP Corepressor Activity in Drosophila. **P. Mani, M. Sutrias-Grau, D.N. Arnosti**. Program in Cell and Molecular Biology; Department of Biochemistry and Molecular Biology, Michigan State University, East Lansing, MI

133 B79 Regulation of Retinoblastoma protein stability and function by the COP signalosome. **M.S. Buckley, Z. Ullah, G.L. Williams, D.N. Arnosti, R. Henry**. Michigan State University, East Lansing, MI; The National Institutes of Health, Bethesda, MD; Brown University, Providence, RI

134 B80 Regulation of dppD—a Hedgehog-regulated enhancer in the Drosophila wing imaginal disc. **P.C. Ference, S. Barolo**. Cell and Developmental Biology, University of Michigan, Ann Arbor, MI

135 B81 Regulation of *atonal* in the *Drosophila* antennal imaginal disc. **E.M. Pueschel, G. Boekhoff-Falk**. University of Wisconsin Madison

136 B82 *C. elegans* HIM-8 functions outside of meiosis to antagonize EGL-13 Sox protein function. **B.L. Nelms, W. Hanna-Rose**. Pennsylvania State University, University Park, PA

137 B83 Genes required for regulating postembryonic cell–matrix adhesion in *Caenorhabditis elegans*. **J. Plenefisch, S. Khandekar, K. Williams, J. Keeler, L. Halpin, J. Quinlan, D. Valletta**. University of Toledo, Toledo OH

138 B84 Functional analysis of PHA-4 isoforms. **J.M. Kalb, M. Stallmer, B. Ricci, J. Makin, V.C. Rott**. Canisius College, Buffalo, NY

139 B85 The *C. elegans* Homeodomain Protein CEH-6 Affects Gene Expression and Development of the Excretory Cell. **K.R. Armstrong, H.M. Chamberlin**. The Ohio State University, Columbus, OH

140 B86 Evolution of transcription factor function: identification of target genes of paralogous gene pairs. **M. Yang, K. Morohashi, B. Nguyen, E. Grotewold, R.S. Lamb**. The Ohio State University

141 B87 Characterization of the *flor1* null mutant during heat stress. **C. Burgeff, E. Zúñiga-Sánchez, E.R. Alvarez-Buylla, A. Gamboa-deBuen**. IE, Univ Natl Autonoma de Mexico, Mexico DF

142 B88 X-linked Mental Retardation (XLMR)-associated Mutations Affect the Activity of the Aristaless-related Homeobox Protein, Arx. **A.N. Waggoner, H.M. El-Hodiri**. Mol., Cel., Dev., Biol. Program, Ohio State Univ. Cols. Oh; Ctr. for Mol. and Hum. Genetics, Children's Res. Inst. Cols, Oh

143 B89 Developmental expression and regulation of receptor for advanced glycation end products (RAGE). **P.R. Reynolds, T.P. Hueckstead, A. Sturrock, J.R. Hoidal**. Univ. of Utah, Salt Lake City, UT

144 B90 Insertion of large-insert clones into the mouse genome by recombinase-mediated cassette exchange. **J. Lu, R.L. Johnson**. Department of Biochemistry and Molecular Biology, Univ. of Texas M.D. Anderson Cancer Center, Houston, TX

145 B91 Disruption of the microRNA pathway by the targeted loss of eIF2C2 results in aberrant primitive streak formation. **R.S. Alisch, T. Caspary, S.T. Warren**. Emory Univ., Atlanta

146 B92 MicroRNA Expression During Mammalian Neurogenesis. **M. Deo, J. Yu, K. Chung, D.L. Turner**. University of Michigan, Ann Arbor, MI

Patterning and Transcription Factors

147 B93 The Gene Expression Database (GXD) for mouse developmental data. **J. Finger, T. Hayamizu, I. McCright, C. Smith, J.T. Eppig, J. Kadin, J. Richardson, M. Ringwald**. The Jackson Laboratory, Bar Harbor, ME

148 B94 Tgif regulates specification of the zebrafish ventral forebrain. **P.A. Gongal, A.J. Waskiewicz**. University of Alberta, Edmonton, Canada

149 B95 The Xfeb gene is a direct target of zic1 and is expressed in the hindbrain. **S. Li, K.W. Cho, C. Merzdorf**. Department of Cell Biology and Neuroscience, Montana State University, Bozeman; Department of Developmental and Cell Biology, University of California, Irvine

150 B96 *from beyond* is required to specify an asymmetric neuronal population. **C.D. Snelson, K. Santhakumar, M.E. Halpern, J.T. Gamse**. Vanderbilt University, Nashville, TN; Carnegie Institute of Washington, Baltimore, MD

151 B97 Olig2-mediated repression of Hes genes determines the spatial pattern and timing of neurogenesis in the spinal cord. **B.G. Novitch, S.E. Weicksel, L. Yang, T. Reddy, L. Teboul, F. Guillemot, T.M. Jessell**. Dept. of Cell and Developmental Biology, Univ. of Michigan, Ann Arbor, MI; Div. of Mol. Neurobiology, NIMR, London, UK; HHMI and Dept. of Biochem. and Mol. Biophysics, Columbia University, New York, NY

152 B98 The activity of Pax3 and Zic1 regulates three distinct cell fates at the neural plate border in Xenopus. **C. Hong, J. Saint-Jeannet**. Univ. of Pennsylvania, Philadelphia, PA

153 B99 GATA-3 participates in a mutually reinforcing transcriptional network in sympathoadrenal development. **T. Moriguchi, K.C. Lim, S. Hasegawa, T. Kuroha, A. Rao, J.D. Engel**. Cell and Developmental Biology, University of Michigan, Ann Arbor, MI

154 B100 A regulatory region upstream of *Nkx2.5* drives spleen and pyloric sphincter expression. **S.F. Burn, R.E. Hill**. MRC Human Genetics Unit, Edinburgh, UK

155 B101 Gli superfamily members in left–right patterning. **S. Wang, J. Purnell, S.M. Ware**. Cincinnati Children's Hospital Medical Center, Cincinnati, OH

156 B102 A novel role of Lipophorin in the processing of the Hedgehog transcription factor *Cubitus interruptus*. **D. Panakova, S. Eaton**. Max Planck Institute for Molecular Cell Biology and Genetics, Dresden, Germany

157 B103 Arabidopsis homologs of transcription domain-associated protein 1 (Tra1) are essential for embryogenesis, growth and development. **Z. Wang, E. Stockinger**. Ohio State University/OARDC, Wooster, OH

158 B104 The essential role of *Pitx2* in extraocular muscle development. **A.L. Evans, P.J. Gage**. University of Michigan, Ann Arbor

159 B105 Fate mapping reveals abnormalities in Brain Region-Specific Neuronal Differentiation and Migration with Loss of Pitx2 Function. **D.M. Martin, J.M. Skidmore, J.F. Martin**. The University of Michigan; Texas A and M University, Houston Texas

160 B106 LHX3 Regulation of Pituitary Size and Cell Specification. **D.L. Butts, B.S. Ellsworth, S.A. Camper**. University of Michigan, Ann Arbor, MI

161 B107 Sox9 genes mediate Fgf-dependent otic induction. **D. Liu, Y. Yan, S. Hans, M. Westerfield**. University of Oregon, Eugene, OR

162 B108 *Math5* expression and function in the central auditory system. **S.M. Saul, R. Altschuler, S. Shore, D.F. Dolan, T. Glaser**. University of Michigan, Ann Arbor, MI

163 B109 Involvement of the forkhead transcription factor FoxN4 in Xenopus retinal progenitor cell development. **L.E. Kelly, S. Nekkalapudi, H.M. El-Hodiri**. Columbus Children's Research Institute

164 B110 Exploration of Math5 regulation and the developing visual system using a GFP-expressing transgene. **R.B. Hufnagel, A.N. Riesenberg, S. Schulz, N.L. Brown**. Children's Hospital Research Foundation, Cincinnati, OH; University of Michigan, MI

165 B111 Paired-less Pax6 has a role in eye development. **J. Kim, J.D. Lauderdale**. Dept. of Cellular Biology, Univ. of Georgia, Athens, GA

166 B112 Function of Lmx1b in the development of ocular anterior segment. **P. Liu, R.L. Johnson**. Univ. of Texas at Houston, MDAnderson Cancer Center, TX

167 B113 Long-range regulation of *Hoxa13* in limb development. **J.A. Lehoczky, M.E. Williams, J.W. Innis**. University of Michigan, Ann Arbor, MI

168 B114 Hox11 genes interact with Eya1 and Pax2 to activate Six2 and Gdnf expression during metanephric kidney induction. **D.M. Wellik, A. Yallowitz, N. Gong, G.R. Dressler, H. Sun**. University of Michigan Medical Center, Ann Arbor, MI

169 B115 Molecular Analysis of a Polydactylous Chicken. **C.M. Bouldin, M.J. Cohn, B.D. Harfe**. Department of Microbiology and Molecular Genetics, Univ. of Florida, Gainesville, FL; Department of Zoology, Univ. of Florida, Gainesville, FL

170 B116 Hox-dependent regulation of *Rhomboid* during Chordotonal organ development. **D.E. Li-Kroeger, B.A. Gebelein**. Cincinnati Children's Hospital Medical Cntr, Cincinnati, OH

171 B117 The role of Tbx20 in endocardial cushion cell proliferation and extracellular matrix remodeling during heart valve development. **E.L. Shelton, K.E. Yutzey**. Molecular and Developmental Biology Graduate Program, University of Cincinnati, Cincinnati, OH

172 B118 Snail family genes are required for left–right asymmetry determination but not neural crest formation in mice. **S.A. Murray, T. Gridley**. The Jackson Laboratory, Bar Harbor, Maine

173 B119 Foxd3 is Required for Neural Crest Development. **L. Teng, Q. Wang, H. Trinh, W. Tu, P.A. Labosky**. University of Pennsylvania, PA

174 B120 Early specification of neural crest and the role of Pax7 on its development. **M.I. Garcia-Castro**. Yale University, New Haven, CT

175 B121 An NF-kB, Slug and Wnt network in Xenopus. **M. Klymkowsky, C. Zhang, T. Carl, E. Trudeau, T. Simmet**. UC Boulder, Boulder, CO.; University of Ulm, Ulm Germany

176 B122 *C. elegans* Sp1 factor LEX-4 functions with the Wnt pathway. **S.F. Sleiman, H.M. Chamberlin**. MCDB Program, The Ohio State University, Columbus, OH; Department of Molecular Genetics, The Ohio State University, Columbus, OH

177 B123 Activation of *Goosecoid* transcription by *Siamois* and *Twin*. **C.D. Reid, S. Bae, D.S. Kessler**. Univ. of Pennsylvania, Philadelphia, PA

178 B124 Genomic analysis of endoderm transcription in Xenopus. **S. Kim, A. Hufton, W. Wong, J. Baker**. Department of Genetics, Stanford University, Stanford, CA; Department of Statistics, Stanford University, Stanford, CA

179 B125 Foxa2 and Not genetically interact in the mouse organizer to pattern posterior notochord. **O.J. Tamplin, J.P. Fawcett, J.G. Sled, A. Gossler, J. Rossant**. Dept. of Mol. and Med. Genetics, Univ. of Toronto; Samuel Lunenfeld Research Institute, Mount Sinai Hospital, Toronto; Institute for Molecular Biology, Hannover, Germany; Hospital for Sick Children, Toronto

180 B126 Conserved Mechanisms In Vertebrate A/P Appendage Patterning. **R. Dahn, M. Davis, N. Shubin**. The Univ. of Chicago, Chicago, IL

Morphogenesis

181 B127 A novel FLRT3 and Rnd1 pathway involved in TGF-β signaling-mediated cellular morphogenesis. **K.W. Cho, S. Ogata, J. Morokuma, T. Hayata, G. Kolle, C. Niehrs, N. Ueno**. University of California, Irvine, CA; National Institute for Basic Biology, Okazaki, Japan; German Cancer Research Center, Heidelberg, Germany

182 B128 Yes-associated protein 65 (YAP65) is required for early Xenopus development. **S.T. Gee, F.L. Conlon, S.L. Milgram**. Univ. of North Carolina Chapel Hill

183 B129 Paraxial mesoderm signals are required for intermediate mesoderm formation in the mouse. **D.L. Chapman**. Dept. of Biological Sciences, University of Pittsburgh, Pittsburgh, PA

184 B130 Vascular differentiation defects associated with activated Notch signaling in endothelia of the mouse embryo. **J.N. Copeland, H. Katayama, J.L. Vivian**. Institute of Maternal–Fetal Biology; Univ. of Kansas Medical Center

185 B131 Inhibition of oral–facial clefting gene Interferon Regulatory Factor 6 disrupts gastrulation, pectoral fin formation, and somite boundary formation in zebrafish. **J. Sabel, C. d'Alencon, N. Rorick, P. Hemerson, B. Schutte, R. Cornell**. Department of Anatomy and Cell Biology, Univ. of Iowa, Iowa City, IA; Department of Pediatrics, Univ. of Iowa, Iowa City, IA; Interdisciplinary Graduate Program in Genetics, Univ. of Iowa, Iowa City, IA

186 B132 A reverse-genetic screen identifying RhoGEF genes that are essential for zebrafish epiboly. **B. Feldman, J. Costa**. National Human Genome Research Institute, NIH, Bethesda MD

187 B133 *Msx1* and *Msx2* are essential for myocardial patterning and morphogenesis of the outflow tract and atrioventricular cushions. **Y. Chen, M. Ishii, H.M. Sucov, R.E. Maxson**. Dept. of Biochemistry and Molecular Biology, Univ. of Southern California, Los Angeles, CA

188 B134 CASTOR is fundamentally required for early embryogenesis in Xenopus. **K.S. Christine, C. Showell, F.L. Conlon**. Carolina Cardiovascular Center, Departments of Biology and Genetics, University of North Carolina Chapel Hill

189 B135 Development of adult abdominal muscle innervation in Drosophila. **A. Subramanian, J. Fernandes**. Miami University, Oxford, Ohio

190 B136 Memory through metamorphosis in *Manduca sexta*. **D.J. Blackiston, E. Silva Casey, M.R. Weiss**. Georgetown Univ., Washington, DC

191 B137 The roles of mouse Fgf16 and Fgf3 during inner ear development. **E.P. Hatch, X. Wang, S.L. Mansour**. Human Genet, Univ of Utah, Salt Lake City, UT

192 B138 Wnt expression during inner ear development. **U.J. Sienknecht, D.M. Fekete**. Purdue University, West Lafayette, IN

193 B139 The dorsal midline as a migration center: insights from the analysis of the *Wnt3a* lineage. **A. Louvi, M. Yoshida, E.A. Grove**. Yale Univ. School of Medicine; Kumamoto Univ., Japan; Univ. of Chicago

194 B140 Effects of Shh on Pax6 and Proliferation in Transdifferentiation. **C. Gutierrez, J.R. Spence, M. Madhavan, K. Del Rio-Tsonis**. Miami University, Oxford, OH

195 B141 Adherens junctions in chick optic development. **R.M. Borges, C. Yan**. Department of Cell and Developmental Biology, University of São Paulo, São Paulo, Brazil

196 B142 Wnt5A, a marker for Dorsal Retinal Pigmented Epithelium. **C. Yan, E. Rossi, F. Siwiec**. Biomedical Sciences Inst., Univ.de São Paulo, São Paulo, SP, Brasil

197 B143 Transdifferentiation in *Xenopus laevis* eye. **A.S. Jerome, M.N. Vergara, K. Del Rio-Tsonis**. Miami University, Oxford, OH

198 B144 Characterization of silica spicule formation during the resuscitation and in vitro cell culture of Hymeniacidon perleve. **W. Zhang, X. Cao, X. Yu**. Marine Bioproducts Engineering Group, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, China.; Graduate School of the Chinese Academy of Sciences, Beijing, China

199 B145 *ram-6* is required for *Caenorhabditis elegans* male sensory rays morphogenesis. **H.Y. Lee, Y.M. Lam, S.W. Tsang, K.L. Chow**. Hong Kong University of Science and Technology, Hong Kong

200 B146 Enhanced BMP signaling through a type I BMP receptor ALK2 shows ectopic cartilage formation in mouse craniofacial portion. **Y. Komatsu, T. Fukuda, G. Scott, N. Kamiya, K. Yamamura, Y. Mishina**. Laboratory of Reproductive and Developmental Toxicology, National Institute of Environmental Health Sciences/NIH, Research Triangle Park; Institute of Molecular Embryology and Genetics, Kumamoto University, Kumamoto, Japan

201 B147 Characterization of cuticular collagen gene *ram-2* in sensory ray morphogenesis. **C.N. Tam, W.S. Hui, K.L. Chow**. Hong Kong University of Science and Technology, Hong Kong

202 B148 Twisted gastrulation (Twsg1) is critical for the morphogenesis of the medial region of the mandibular arch. **A. Petryk, M.P. Jarcho, N. Lowe, M. Mina, R. Gopalakrishnan**. Univ. of Minnesota, Minneapolis; Univ. of Connecticut Health Center, Farmington

203 B149 BMP signaling and the temporal control of mandibular osteogenesis. **A.E. Merrill, B.F. Eames, S.J. Weston, T. Heath, R.A. Schneider**. Univ. of California, San Francisco, CA

204 B150 Spatiotemporal regulation of mandibular neuromusculoskeletal integration. **C. Mitgutsch, B.F. Eames, K. Au, N. Sinth, A. Kaplan, R.A. Schneider**. Univ. of California, San Francisco, CA

205 B151 Local and systemic mechanisms controlling osteogenesis. **A.H. Jheon, B.F. Eames, R.A. Schneider**. Univ. of California, San Francisco, CA

206 B152 The TGF-β ligand derrière cooperates with Xnr1 and the nodal inhibitor Coco to establish the left–right axis in Xenopus. **A. Vonica, A.H. Brivanlou**. The Rockefeller University, New York, NY

207 B153 The Role of the Pitx2c N-terminus in Left–Right Patterning. **A. Simard, L. Di Giorgio, A.K. Ryan**. Department of Pediatrics, McGill University-RI-MUHC, Montréal, Québec, Canada; Department of Human Genetics, McGill University-RI-MUHC, Montréal, Québec, Canada; Department of Pediatrics and Human Genetics, McGill University-RI-MUHC, Montréal, Québe

208 B154 Chick Claudin-1 function in the establishment of the left–right axis. **E. Di Pietro, A. Simard, A.K. Ryan**. Department of Human Genetics, RI-MUHC; Departments of Pediatrics, RI-MUHC; Departments of Human Genetics and Pediatrics, RI-MUHC, McGill University, Montreal, Quebec, Canada

209 B155 An engineered tissue model to determine position-specific behavior during mammary epithelial branching morphogenesis. **C.M. Nelson, M. van Duijn, J.L. Inman, D.A. Fletcher, M.J. Bissell**. Lawrence Berkeley National Laboratory, Berkeley, CA; University of California, Berkeley, CA

210 B156 R-spondin2 is required for tracheal and lung morphogenesis. **S.M. Bell, J.A. Whitsett**. Cincinnati Children's Hospital Medical Center, Cincinnati, OH

Cell Fate

211 B157 Control of leaf vascular patterning by polar auxin transport. **T. Berleth, E. Scarpella, J. Friml, D. Marcos**. Department of Botany, University of Toronto, Canada; Department of Biological Sciences, University of Alberta, Edmonton, Canada; Center for Plant Molecular Biology (ZMBP), Tübingen University, Germany

212 B158 Mechanisms underlying hormone-induced changes in plant development û a genetic approach. **I. Swinehart, M.A. Dietrich**. Grand Valley State University, Allendale, MI

213 B159 A mouse embryonic stem cell model for Schwann Cell differentiation. **T.M. Roth, P. Ramamurthy, F. Ebisu, K.F. Barald**. University of Michigan Medical School, Department of Cell and Developmental Biology, Ann Arbor, MI

214 B160 Role of the *Drosophila melanogaster bubblegum* and *doublebubble* genes in nervous system patterning and embryogenesis. **A.J. Sivatchenko, A. Letsou**. Univ. of Utah, Salt Lake City, UT

215 B161 A microarray for Olig2 targets identifies potential regulators of neural progenitor cell maintenance in the developing spinal cord. **Z.B. Gaber, T. Reddy, P. Assis, B.G. Novitch**. University of Michigan Medical School, Department of Cell and Developmental Biology, Ann Arbor, MI

216 B162 Characterization of a novel bHLH protein in the developing spinal cord. **K. Skaggs, M. Yang, B. Novitch**. Neuroscience Program, Univ. of Michigan; Dept. of Cell and Developmental Biology, Univ. of Michigan Medical School; Univ. of Michigan

217 B163 The function of Growth/Differentiation Factor 11 (Gdf11) in patterning the caudal spinal cord. **J. Liu**. University of Virginia, Charlottesville, VA

218 B164 Polarity kinases PAR-1 and PAR-4 (LKB1) are required for Wnt signaling, convergent extension and neurogenesis in vertebrate development. **J.B. Green, O. Ossipova**. Guy's Hospital, King's College London, London, UK; Mount Sinai Medical Center, New York, NY

219 B165 Characterization of cortical neurons that transiently express TH during rat brain development. **S. Asmus, M. Ball, A. Bohnen, K. Phelps, C. Hartley, R. Steed**. Centre College, Danville, KY

220 B166 The orphan nuclear receptor Nr2e3 plays dual functions in rod photoreceptor differentiation. **H. Cheng, T.S. Aleman, A.V. Cideciyan, M. Akimoto, S.G. Jacobson, A. Swaroop**. Univ. of Michigan, Ann Arbor, MI; Univ. of Pennsylvania, Philadelphia, PA; Kyoto University hospital, Kyoto, Japan

221 B167 Misexpression of neuroD in the developing zebrafish retina: effect on proliferation and photoreceptor genesis. **M.J. Ochocinska, P.F. Hitchcock**. Neurosci. Prog., Univ. of Michigan, Ann Arbor, MI

222 B168 Photoreceptor subtype specification and mosaic patterning in zebrafish. **J.M. Fadool, K. Alvarez-Delfin, A.C. Morris**. Florida State Univ., Tallahassee, FL

223 B169 Role of Senseless in late color photoreceptor differentiation in Drosophila. **B. Xie, T. Cook**. Cincinnati Children's Hospital Medical Center, Cincinnati, OH

224 B170 Mapping the functional domains of Otd during eye development in Drosophila. **E. McDonald, E. Wimmer, T. Cook**. Cincinnati Children's Hospital Medical Center, Cincinnati, OH; Georg-August-University Goettingen, Goettingen, Germany

225 B171 Role of Pros/Prox1 during lens development in Drosophila. **S. Whitaker, N. Schaeublin, T. Cook**. Cincinnati Children's Hospital Medical Center, Cincinnati, OH

226 B172 Lens: a ground state for all sensory placodes? **A. Streit, A. Bailey, S. Bhattacharyya, M. Bronner-Fraser**. Department of Craniofacial Development, King's College London, London, UK; California Institute of Technology, Pasadena, CA

227 B173 Role of homeodomain transcription factor Six1 in olfactory sensory neuron development. **K. Ikeda, Z. Ando, S. Oowakara, K. Kawakami**. Jichi Medical University, Tochigi, Japan

228 B174 The role of notch signaling during early ear development. **C.S. Jayasena, T. Ohyama, C. Murtaugh, N. Segil, A.K. Groves**. House Ear Institute, Los Angeles, CA; Univ. of Utah, Salt Lake City, UT

229 B175 Development of the cochlea in the absence of all Notch signaling: A study of O-fucosyltransferase conditional knock out mice. **M.L. Basch, T. Ohyama, P. Stanley, A.K. Groves, N. Segil**. House Ear Institute, Los Angeles, CA; Albert Einstein College of Medicine, New York, NY

230 B176 Is there a neurotransmitter default state? **K.I. Fisher, M.S. Saha**. College of William and Mary, Williamsburg, VA

231 B177 Specification of neurotransmitter phenotypes in *Xenopus laevis*. **N.I. Golub, R.M. Fame, M.S. Saha**. College of William and Mary, Williamsburg, VA

232 B178 The effects of cell cycle cessation on neurotransmitter specification in X. laevis. **M. Wester, C. Sipe, M. Saha**. College of William and Mary, Williamsburg, VA

233 B179 Molecular profile and developmental potential of migrating neural crest cells. **V.M. Lee**. Medical College of Wisconsin; California Inst. of Technology

234 B180 Transcription factor AP-2alpha and AP-2gamma act redundantly in zebrafish neural crest specification. **W. Li, R.A. Cornell**. Department of Anatomy and Cell Biology and Genetics Graduate Program, Univ. of Iowa, Iowa City, IA

235 B181 A Role For Anaplastic Lymphoma Kinase (ALK) Function In Zebrafish Neural Crest Development. **R.N. Kelsh, X. Yang, J. Mueller, A. Ward**. Centre for Regenerative Medicine, University of Bath, Bath, UK

236 B182 Characterization of neural crest and lateral plate mesoderm development in zebrafish *hatchback*. **M.E. Lucas, P.D. Henion**. Molecular, Cellular, and Developmental Biology Program, The Ohio State University, Columbus, OH; Department of Neuroscience, Molecular, Cellular, and Developmental Biology Program, The Ohio State University, Columbus, OH

237 B183 Lineage analysis of Rohon-Beard sensory neurons and neural crest cells. **C.K. Cortez, K.B. Artinger**. Univ. of Colorado at Denver and Health Science Center, Aurora, CO

238 B184 Epithelial–mesenchymal transition regulators Snail and Twist are required for PMC ingression in the sea urchin embryo. **S. Wu, D.R. McClay**. DCMB Group, Department of Biology, Duke University, Durham, NC

239 B185 Clearing the way: the small GTPase RhoA and endomesodermal specification. **W.S. Beane, D.R. McClay**. Duke Univ., Durham, NC

240 B186 The *Ciona intestinalis MyoD* homolog is essential for myogenesis. **T.H. Meedel, H. Yasuo, P. Chang**. Rhode Island College, Providence, RI; UMR7009/CNRS, Station Zoologique/UPMC, Villefranche-sur-mer, France

241 B187 TGF-beta and LIN-12/Notch signaling pathways regulate dorsal–ventral patterning of the *C. elegans* post-embryonic mesoderm. **M.L. Foehr, A.S. Lindy, R. Fairbank, N.M. Amin, J. Liu**. Cornell University, Ithaca, NY

242 B188 FACS-assisted microdissection of photolabeled cells to identify germ-layer specific genes. **B. Feldman, J.L. Boorech, H. Noushmehr, M. Kirby, A.G. Elkahloun**. National Human Genome Research Institute, NIH, Bethesda, MD

243 B189 Hennin: dual roles for cilia proteins in mammalian development. **T. Caspary, K.V. Anderson**. Department of Human Genetics, Emory University School of Medicine; Developmental Biology Program, Memorial Sloan Kettering Cancer Center

244 B190 Gonadotrope cell specification in the pituitary gland. **S. Davis, S. Camper**. University of Michigan

Poster Session II

Monday, June 19, 12–1:30 pm, 7:30–10 pm
Numbers in ***italics*** indicate Program Abstract numbers. "B" numbers indicate Poster Board numbers.
Odd Board number authors present posters on Monday, June 19, 12–1:30 pm
Even Board number authors present posters on Monday, June 19, 8–10 pm

Poster Session II themes: ***Evolution and Development, Functional Genomics, Cell–cell Signaling, Intracellular Signaling Pathways, Early Embryo Patterning, Organogenesis, Germ Cells and Gametogenesis. Late Abstracts.***

Evolution and Development

245 B1 How many steps to build animals? **P.A. Nelson**. Biola University, La Mirada, CA

246 B2 Development of mandibular and clavicular secondary cartilage is strongly influenced by mechanical cues from the skeletal musculature. **I. Rot-Nikcevic, B. Kablar**. Dalhousie University, Halifax, NS, Canada

247 B3 Lamprey Type II Collagen and Sox9 reveal an ancient origin of the vertebrate collagenous skeleton. **G. Zhang, M.M. Miyamoto, M.J. Cohn**. Zoology Department, University of Florida, Gainesville, FL

248 B4 Genetic stabilization of vertebrate bilateral limb symmetry as an example of cryptic polarity. **U.J. Sienknecht**. Biological Sciences, Purdue University, West Lafayette, IN

249 B5 Limb heterochrony in a marsupial, *M. domestica*. **A.L. Keyte, T. Imam, K.K. Smith**. Duke Univ., Durham, NC

250 B6 Comparative development of mammalian and alligator metapodial growth plate formation. **P.L. Reno, C. Lovejoy, R.M. Elsey, W.E. Horton**. Kent State Univ., OH; Louisiana Dept. of Wildlife and Fisheries; NEOUCOM, Rootstown, OH

251 B7 Effect of a single dose of ethanol on developing peripheral nerve of chick embryos. **J.D. Chaudhuri**. Midwestern University, Glendale, AZ

252 B8 Divergent axon growth patterns among arthropods coincide with changes in netrin expression patterns. **W. Simanton, S. Clark, A. Hasley, B. Hill, E. Grunow, W. Browne, M. Duman-Scheel**,. Albion College, Albion, MI; University of Hawaii, Honolulu, HI

253 B9 Selection on neurodevelopmental actions of thyroid hormone underlies the conservation of thyroid hormone receptor genes in *Necturus maculosus*. **M.F. Miller, R.J. Denver**. Dept. of Molecular, Cellular and Developmental Biology, Univ. of Michigan, Ann Arbor, MI

254 B10 Sex pheromone in dioecious nematode: its production and perception pathway. **K.L. Chow, W.K. So, C.M. Chan, M.Y. Wu, W.S. Yeung**. Hong Kong University of Science and Technology, Hong Kong

255 B11 Pax6 and Atonal expression during embryonic eye formation in the American Horseshoe crab, *Limulus polyphemus*. **K.W. Conley, D.C. Blackburn, D. Plachetzki, K. Kempler, J. Currie, B.A. Battelle, N.L. Brown**,. Children's Hospital Research Foundation and University of Cincinnati, Cincinnati, OH; Harvard University, Cambridge, MA; University of California, Santa Barbara, CA; The Whitney Laboratory and University of Florida, St. Augustine, FL; Northwestern

256 B12 Analysis of eye selector gene function in the visual system of the red flour beetle *Tribolium castaneum*. **X. Yang, M. Friedrich**. Wayne State University, Detroit, MI

257 B13 Developmental evolution of insect metamorphosis: transient silencing of eye selector genes in grasshopper nymphs mimics temporal dynamics of visual system development in higher insects. **M. Friedrich, Y. Dong**. Wayne State University, Detroit, MI; UT Southwestern Medical Center, Dallas, TX

258 B14 Genetic basis of pigmentation differences within and between Drosophila species. **P.J. Wittkopp, B.K. Haerum, E. Stewart, A. Ratnala, G. Kalay, G. Smith-Winberry**. Univ. of Michigan, Ann Arbor, MI

259 B15 How to grow bigger legs: insights from insects. **A. Popadic, N. Mahfooz, N. Turchyn**. Wayne State University, Detroit, MI

260 B16 The developmental and molecular basis of allometry in *Drosophila*. **A.W. Shingleton, J.A. Brisson, D.L. Stern**. Michigan State University, East Lansing, MI; Princeton University, Princeton, NJ

261 B17 Cardiac arterial pole development is conserved in vertebrates. **M.L. Kirby, A. Grimes**. Duke University, Durham, NC; Medical University of South Carolina, Charleston, SC

262 B18 Hox genes and development of paired fins in teleost: an alternative view. **D. Ahn, R.K. Ho**. Univ. of Chicago, Chicago, IL

263 B19 Differential partitioning of paralog group 2 *Hox* gene expression within the Osteichthyii. **J. Scemama, P. Le Pabic, E.J. Stellwag**. East Carolina University, Greenville, NC

264 B20 Genetic analyses of adult pigment pattern development reveal homology and evolutionary novelty in danio fishes. **M.G. Mills, R.J. Nuckels, D.M. Parichy**. Department of Biology, University of Washington, Seattle WA

265 B21 Characterization of Zebrafish Deltex Homologues. **S. Tan, H. Xu, Y. Jiang**. Laboratory of Developmental Signalling and Patterning, Institute of Molecular and Cell Biology, 61 Biopolis Drive, Singapore

266 B22 A Zebrafish Pax6a Reporter BAC Recapitulates Pax6 Expression In The Mouse. **J. Lakowski, J.D. Lauderdale**. Univ. of Georgia, Athens, GA

267 B23 Cis-regulation of the Pax6 gene in the ascidian *Ciona intestinalis*. **V.C. Fonseca, S.Q. Irvine**. Univ. of Rhode Island

268 B24 Analysis of a Pax group IV gene in the leech. **I.K. Quigley, X. Xie, M. Shankland**. University of Texas, Austin, Texas

269 B25 Analysis of Pax genes during leech development. **M. Schmerer, M. Shankland**. Univ. of Texas at Austin, Austin, TX

270 B26 Evolutionary analysis of the cis-regulatory region of *SM50*, a gene that is essential for skeletogenesis in the sea urchin. **J.L. Walters, E.M. Binkley, R. Haygood, L.A. Romano**. Denison University, Granville, OH; Duke University, Durham, NC

271 B27 ***withdrawn***

272 B28 Can RNAi be used to sterilize Ascaris? **G. Gao, K. Bennett**. Univ. of Missouri Columbia, MO

Functional Genomics

273 B29 Cis-regulatory organization of the Dll-B gene in *Ciona intestinalis*. **S.Q. Irvine**. Univ. of Rhode Island, Kingston, RI

274 B30 A tale of two morphogen gradients: identifying Gli targets of Hedgehog Signaling. **S.A. Vokes, H. Ji, W.H. Wong, A.P. McMahon**. Harvard University, Cambridge, MA; Stanford University, Stanford, CA

275 B31 Small molecule-directed protein mislocalization. **P. Geda, N. Bharucha, C.J. Dobry, J.E. Gestwicki, A. Kumar**. University of Michigan, Ann Arbor, MI

276 B32 An Updated Database and User Interface for the GEISHA Gene Expression Resource. **D.K. Darnell, S. Kuar, S. Stanislaw, S. Davey, J.A. Konieczka, P. Antin**. Dept. Cell Biology and Anatomy, Univ. Arizona, Tucson, AZ; Dept. Molecular and Cellular Biology, Univ. Arizona, Tucson, AZ

277 B33 Deciphering the Molecular Evolution of the Ependymin Protein Family. **E.C. Suárez-Castillo, J.E. García-Arrarás**. Biology Dpt, University of Puerto Rico, Río Piedras Campus, PR

Cell–Cell Signaling

278 B34 ***withdrawn***

279 B35 Hh-dependent Pdgf signaling mediates zebrafish palatogenesis. **J.K. Eberhart, M.E. Swartz, T.C. Boling, C.B. Kimmel**. Univ. of Oregon, Eugene, OR

280 B36 Retinoic acid antagonism of FGF signaling during node stages. **G. Duester, I. Sirbu**. Burnham Institute for Medical Research, La Jolla, CA

281 B37 Signaling Networks via the Epithelio-Mesenchymal Interactions during Early Development of Mouse Tongue. **Y. Taya, T. Hirano, K. Sato, T. Aoba**. Dept. of Pathol., Nippon Dental Univ., Tokyo, Japan

282 B38 Endoderm patterning in embryos and in human ES cell cultures. **J.M. Wells, B.A. Moore-Scott, S. Lin, R. Opoka**. Cincinnati Children's Hospital Research Foundation, Cincinnati, OH

283 B39 HBEGF Prevents Trophoblast Apoptosis Due to Reoxygenation Injury During Placentation. **D. Armant, B.A. Kilburn, P.J. Chiang, A. Petkova, R. Romero, R.E. Leach**. Department of OB/GYN, Wayne State University, Detroit, MI; Perinatology Research Branch, NICHHD, NIH, DHHS, Bethesda, MD; Department of OB/GYN, University of Illinois, Chicago, IL

284 B40 A role for Notch signaling in the interpretation of cell fates in a morphogen gradient. **L. Dobens, B. Levine**. Univ. Missouri Kansas City, Kansas City, MO

285 B41 Tissue specific regulation of DPP/BMP4 activity and signaling range by differential cleavage of the precursor in Drosophila. **S. Sopory, M. Wehrli, J.L. Christian**. Oregon Health and Science Univ., Portland, OR

286 B42 Delayed effect of a maternal BMP on establishment of the embryonic dorsal–ventral axis. **H.M. Araujo, K. Carneiro, M.R. Fontenele, E.M. Negreiros, E. Bier**. Federal University of Rio de Janeiro, Rio de Janeiro, Brazil; University of California at San Diego, La Jolla

287 B43 CRM-1 facilitates BMP signaling in *Caenorhabditis elegans*. **Y.F. Wong, C.F. Ko, K.L. Chow**. Hong Kong University of Science and Technology, Hong Kong

288 B44 Mutation of an upstream cleavage site in the BMP4 prodomain leads to tissue-specific loss of activity. **D.C. Goldman, R. Hackenmiller, T. Nakayama, S. Sopory, C. Wong, H. Kulessa, J.L. Christian**. OHSU, Portland, OR; Vanderbilt Univ. Med. Center, Nashville, TN

289 B45 BMP regulates multiple processes during retina regeneration. **T. Haynes, C. Gutierrez, J. Aycinena, B. Lehman, S. Reddy, K. Del Rio-Tsonis**. Miami University, Oxford, OH

290 B46 Understanding the mechanism of Wnt coreceptor LRP6 activation. **H. Huang, X. He**. Neurobiology Program, Department of Neurology, Children's Hospital, Boston, MA

291 B47 The Wnt3A palmitoylation site is required for high affinity Frizzled binding. **J.D. Brown, J. Kanya**. Washington College, Chestertown, MD

292 B48 ***withdrawn***

293 B49 Xlefty exhibits functional activity in the absence of a mature ligand domain. **W.W. Branford, J. Shen, H. Yost**. Dept. of Biological Sciences, Wayne State U, Detroit, MI; Huntsman Cancer Institute, Dept. of Oncological Sciences, U of Utah, Salt Lake City, UT

294 B50 Using *Xenopus laevis* as an indicator species for monitoring wetlands reclamation. **S. Raymond, K.L. Curran**. Univ. of Wisc0onsin Whitewater, Whitewater, WI

295 B51 Edn1/Ednra pathway in Xenopus neural crest development. **M. Bonano, C. Tribulo, T. Aguero, J. DeCalisto, R. Mayor, S. Sanchez, M. Aybar**. Dept. Biol. Desarrollo, INSIBIO-UNT, Tucuman, Argentina; MNDB, Fac. Cs., Univ. Chile, Chile; Dept. Anat. and Dev. Biology, UCL, UK

296 B52 Banded hedgehog and Gli intracellular factors control Xenopus neural crest specification. **T. Aguero, G. Vega Lopez, S. Sanchez, M. Aybar**. Dept. Biol. Desarrollo, INSIBIO-UNT, Tucuman, Argentina; MNDB, Fac. Cs., Univ. Chile, Chile

297 B53 A mutant with defective temporal coordination of uterine and vulval development in *C. elegans* is associated with reciprocal signaling defects. **W. Hanna-Rose, L. Huang**. Department of Biochemistry and Molecular Biology, Penn State, University Park, PA

298 B54 The chemokine Sdf1 and its receptor Cxcr4 are involved in the formation of fast muscle. **S. Chong, N. Le-Minh, Y. Jiang, V. Korzh**. Laboratory of Developmental Signaling and Patterning, Institute of Molecular and Cell Biology, Singapore; Laboratory of Fish Developmental Biology, Institute of Molecular and Cell Biology, Singapore

299 B55 Lrp4 is required for neuromuscular junction formation and differentiation. **S.D. Weatherbee, K.V. Anderson, L.A. Niswander**. Memorial Sloan Kettering, New York, NY; HHMI, Univ. of Colorado Health Sci. Ctr., CO

300 B56 Cilia/IFT in mammalian limb patterning. **C.J. Haycraft, Q. Zhang, B. Song, R. Serra, B.K. Yoder**. University of Alabama at Birmingham, Birmingham, AL; University of Iowa, Iowa City, IA

301 B57 Role of PDGFR-alpha in Vertebral Arch Development. **E. Pickett, M.D. Tallquist**. Department of Molecular Biology, UT Southwestern Medical Center, Dallas, TX

302 B58 ***withdrawn***

303 B59 Tectonic, a novel secreted regulator of primary cilia formation and Hedgehog responsiveness. **J.F. Reiter**. Univ. of California, San Francisco, CA

304 B60 ***withdrawn***

305 B61 Two receptor-like kinases required for pattern formation during Arabidopsis embryogenesis. **M. Nodine, R. Yadegari, F. Tax**. Univ. of Arizona, Tucson, AZ

Intracellular Signaling Pathways

306 B62 The Role Of O-GlcNAc in zebrafish embryogenesis. **D.M. Webster, L. Wells, S.T. Dougan**. University of Georgia

307 B63 Wnt and G protein signaling in primitive and parietal endoderm differentation. **R. Krawetz, Q. Sun, G.M. Kelly**. Univ. of Western Ontario, London, ON

308 B64 Signaling via GSK-3 is required during midline skeletogenesis. **K.J. Liu, J.R. Arron, K. Stankunas, G.R. Crabtree**. Stanford University School of Medicine/HHMI

309 B65 Role of the RGS (regulator of G-protein signaling) domain of axin in vertebrate axis formation. **P.N. Schneider, D.C. Slusarski, D.W. Houston**. Interdisciplinary Program in Genetics, University of Iowa, Iowa City, IA; Department of Biological Sciences, University of Iowa, Iowa City, IA

310 B66 Identification of a novel xPAK1 partner important for proper FGF signaling in *Xenopus laevis*. **S. Jean, M. Tremblay, T. Moss**. Cancer Research Center and Department of Medical Biology, Laval University, Hotel-Dieu de Quebec, Canada

311 B67 XRyk is a novel regulator of convergence extension movements in *Xenopus laevis*. **J. Her, J. Han**. Division of Molecular and Life Sciences, Pohang University of Science and Technology

312 B68 Induction of apoptosis by troglitazone requires peroxisome proliferator-activated receptor-gamma and ERK in lung cancer cells. **G.G. Chen, M. Li, T.W. Lee, T.S. Mok, A.P. Yim**. The Chinese University of Hong Kong, Shatin, N.T., Hong Kong

313 B69 Human fetal development is necessary for leukocytic TLR maturation against bacterial infection. **B. Zheng, H. Hao, T.T. Ritter, P.H. Wooley**. Yunnan University, Kunming, China; Wayne State University, Detroit MI

314 B70 Novel function of POSH, a JNK scaffold, as an E3 ubiquitin ligase for the Hrs stability on early endosomes. **G. Kim, E. Park, Y. Kong, J. Han**. Division of Molecular and Life Sciences, Pohang University of Science and Technology, Republic of Korea

315 B71 The Role of LPA Signaling in Development of the Anterior Nervous System. **R.B. Lloyd, S. Lang, K. Schaible, C. Wylie**. University of Cincinnati, Cincinnati, OH; Division of Developmental Biology CHRF Cincinnati, OH

316 B72 Signaling complexes regulating axon outgrowth. **A.B. Vojtek, C. Figueroa, K. Chung, J. Taylor, M. Deo, A.W. Avery, D.L. Turner**. University of Michigan, Ann Arbor, MI

317 B73 Polycistronic RNA polymerase II expression vectors for RNA interference based on miR -155. **K. Chung, C.C. Hart, S. Al-Bassam, A. Avery, J. Taylor, P.D. Patel, A.B. Vojtek, D.L. Turner**. University of Michigan, Ann Arbor, MI

318 B74 Simple sequence domain of Ci regulates proteolytic processing. **R.A. Holmgren, L. Tian, A. Matouschek**. Northwestern Univ., Evanston, IL

319 B75 Identification and characterization of a mechanism for Tbx5 nuclear export. **A. Kulisz, H. Simon**. Department of Pediatrics, Northwestern University Feinberg School of Medicine and Children's Memorial Research Center, Chicago, IL

320 B76 Frodo links Dishevelled to the p120-catenin/ Kaiso pathway: members of distinct catenin sub-families promote Wnt signals in vertebrate development. **P.D. McCrea, J. Park, H. Ji, S. Jun, L. Li, H. Hikasa, S.Y. Sokol**. University of Texas MD Anderson Cancer Center, Houston TX; Mount Sinai School of Medicine, New York NY

321 B77 Subcellular Localization and Signaling Properties of Dishevelled in Developing Vertebrate Embryos. **R.S. Gray, T. Park, A. Sato, R. Habas, J.B. Wallingford**. Section of Molecular Cell and Developmental Biology, and Institute for Cellular and Molecular Biology, University of Texas, Austin, TX; 2. Department of Biochemistry, Robert Wood Johnson Medical School, Piscataway, New Jersey; Cancer Institute of New Jerse

322 B78 B56 epsilon regulatory subunit of PP2A is required for the IGF/PI3K/Akt pathway during eye induction and the Hedgehog pathway during eye field separation. **J. Yang, A.M. Rorick, W. Mei**. Ohio State University, Columbus, OH

Early Embryo Patterning

323 B79 Time-dependent patterning of the germ-layers by Nodal signals. **S.T. Dougan, E.G. Hagos**. University of Georgia, Athens

324 B80 PTEN in Zebrafish Gastrulation. **A. Finkielsztein, Q.Z. Sun, C. Hillis, G.M. Kelly**. Univ. of Western Ontario, London, Ontario

325 B81 Uncovering genes essential for neuronal development in zebrafish using a GFP-based forward genetic screen. **A. Gulati-Leekha, D. Goldman**. University of Michigan, Ann Arbor

326 B82 Her9-dependent regulation of neurogenesis by Zic family proteins. **M.J. Keller, A.B. Chitnis**. Laboratory of Molecular Genetics, NIH/NICHD, Bethesda, MD

327 B83 Requirement of Calcium Modulation in Organ Laterality. **I. Schneider, H. Griesbach, D.C. Slusarski**. Department of Biological Sciences, University of Iowa, Iowa City, IA

328 B84 KUPFFER'S vesicle in zebrafish. **N. Okabe, R.D. Burdine**. Princeton Univ.

329 B85 Squint protects early embryos from temperature-induced dysmorphology. **B. Feldman, W. Pei, H. Williams, M. Clark, D.L. Stemple**. National Human Genome Research Institute,
NIH, Bethesda MD; Sanger Institute, Wellcome Trust Genome Campus, Hinxton, UK

330 B86 ***withdrawn***

331 B87 ***withdrawn***

332 B88 New insights into left–right patterning: the role of *pkd2* in the zebrafish. **J. Schottenfeld, R.D. Burdine**. Princeton University

333 B89 Intrinsic chirality of the Xenopus egg cortex and left–right axis patterning. **M. Danilchik, B. Brown, K. Riegert**. OHSU, Portland, Oregon

334 B90 A leftward fluid-flow precedes nodal induction in Xenopus. **M. Blum, A. Schweickert, T. Beyer, T. Weber, P. Andre, A. Fischer, C. Viebahn, M. Levin**. University of Hohenheim, Stuttgart, Germany; University of Gottingen, Gottingen, Germany; The Forsyth Institute, Boston, MA

335 B91 sFRPs inhibit tolloid metalloproteinases. **H.X. Lee, A.L. Ambrosio, E.M. De Robertis**. University of California, Los Angeles/Howard Hughes Medical Institute

336 B92 Xenopus P21-activated kinase1 (X-PAK1) regulates Tumorhead (TH) distribution in the neural field cells during Xenopus neurulation. **C. Wu, C. Delsert, E.E. Traverso, M. Kloc, N. Morin, L.D. Etkin**. The Univ. of Texas M.D. Anderson Cancer Center, Houston, TX; FRE 2593 Centre National de la Recherche Scientifique, Montpellier, France

337 B93 *In vivo* time-lapse analysis of cell divisions during neural tube closure. **E.K. Kieserman, J.M. Tyszka, J.B. Wallingford**. University of Texas at Austin, Austin, TX; California Institute of Technology, Pasadena, CA

338 B94 Expression of Panza, anα2-Macroglobulin, in a Restricted Dorsal Domain of the Primitive Gut in *Xenopus laevis*. **L.L. Pineda Salgado, E.J. Craig, R.B. Blank, D.S. Kessler**. University of Pennsylvania School of Medicine, Philadelphia, PA

339 B95 *Xenopus tropicalis* Genetics Identifies Chromatoblast Stem Cell Mutant. **T.C. Grammer, M.K. Khokha, M.A. Lane, R.M. Harland**. Molecular and Cell Biology, UC Berkeley; Center for Integrated Genomics, UC Berkeley; Department of Pediatrics, Yale School of Medicine

340 B96 A G protein-coupled receptor (Xflop) controls cortical actin assembly via EP-cadherin complex in early Xenopus embryos. **Q. Tao, C. Wylie**. Children's Hospital Medical Center, Division of Developmental Biology, Cincinnati, OH

341 B97 An exploration of the nuclear localization of intersectin in *Xenopus laevis*. **A.E. Prendergast, M.A. Burch, C.E. Fundakowski, E.M. Mandel, B.N. Dorothy, J.M. Thorn**. Knox College, Galesburg, IL; Rush College of Medicine, Chicago, IL; University of North Carolina at Chapel Hill, Chapel Hill, NC; National College of Naturopathic Medicine, Portland, OR

342 B98 Lunatic fringe plays multiple, distinct roles during vertebrate segmentation. **S.E. Cole, E.T. Shifley, A. Perez-Balaguer, J.D. Franklin**. Department of Molecular Genetics, Ohio State Univ.

343 B99 The regulation of oscillatory LUNATIC FRINGE protein activity during somitogenesis. **E.T. Shifley, S.E. Cole**. Department of Molecular Genetics, The Ohio State University, Columbus OH

344 B100 BMP signaling in the epiblast is required for proper recruitment of the prospective paraxial mesoderm and development of somites. **S. Miura, S. Davis, J. Klingensmith, Y. Mishina**. Laboratory of Reproductive and Developmental Toxicology, National Institute of Environmental Health Sciences, Research Triangle Park, NC; Department of Cell Biology, Duke University Medical Center, Durham NC

345 B101 The Role of Geminin in Post-Implantation Mouse Embryos and Embryonic Stem Cells. **L.S. De Boer, D. Yang, T.E. Gratsch, K.S. O'Shea**. University of Michigan, Ann Arbor

346 B102 Cephalic neural tube closure requires BMP2 expression. **T. Castranio, Y. Mishina**. Laboratory of Reproductive and Developmental Toxicology, National Institute of Environmental Health Sciences, National Institute of Health, Research Triangle Park, NC

347 B103 BMP and Nodal signaling act synergistically in mammalian rostral patterning. **Y. Yang, R. Anderson, J. Klingensmith**. Dept of Cell Biology, Duke University Medical Center

348 B104 Characterization of a novel gene expressed exclusively in the zone of polarizing activity in the vertebrate limb. **B.D. Harfe, J.R. Rock**. Univ. of Florida, Gainesville, FL

349 B105 Ndst1 Is Required For FGF Signaling In Early Lens Development. **Y. Pan, A. Woodbury, J.D. Esko, K. Grobe, X. Zhang**. Department of Medical and Molecular Genetics, Indiana University of Medicine, Indianapolis, IN; Department of Cellular and Molecular Medicine, Glycobiology Research and Training Center, University of California San Diego, La Jolla, CA; Dept. of General Zoology and Genetics, Westfälische Wilhelms-Universität Münster, Germany.

350 B106 *Hoxa1*-lineage analysis suggests novel domains of *Hoxa1* function. **N. Makki, B.R. Arenkiel, M.R. Capecchi**. University of Utah, Salt Lake City, UT; Duke University, Durham, NC

351 B107 Rbm19 is essential for nucleologensis in the early mouse embryo. **J. Zhang, A.N. Mayer**. Gastroenterology Section, Department of Pediatrics, Medical College of Wisconsin, and Children's Research Institute, Milwaukee, WI

352 B108 Characterization of zic1 and zic2 expression in early chick embryos. **A. McMahon, L. Sun Rhodes, C. Merzdorf**. Department of Cell Biology and Neuroscience, Montana State University, Bozeman

353 B109 The role of Giant in anterior patterning in *Drosophila melanogaster*. **G. Yucel, S.J. Small**. New York Univ., NY

354 B110 Testing the Bicoid morphogen hypothesis in *Drosophila*. **A. Ochoa-Espinosa, S.J. Small**. New York Univ., NY

355 B111 Hunchback Target Genes are Patterned by Two Different Mechanisms in the Early Drosophila Embryo. **D. Yu, S. Small**. New York University, New York, NY

356 B112 The PAM-1 aminopeptidase is essential for meiotic exit and polarity in the one-cell *C. elegans* embryo. **R. Lyczak, L. Zweier, L. Washam, M. Murrow, T. Group, B. Bowerman**. Ursinus College, Collegeville, PA; Univ. of Oregon, Eugene, OR

357 B113 Caution, regulatory network assembly in progress. **C.J. Roehrig, L. Baugh, J.M. Claggett, S. Shen-Orr, J.J. Smith, I. Yanai, C.P. Hunter**. Harvard University, Cambridge, MA; California Institute of Technology, Pasadena, CA; University of California, San Diego, La Jolla, CA

358 B114 Gap junctions are required for activation of the 3D organizer in Ilyanassa. **A. Nakamoto, L.M. Nagy**. Department of Molecular and Cellular Biology, University of Arizona, Tucson, AZ

359 B115 Gap junctions mediate asymmetric gene expression in rabbit embryos. **K. Muders, A. Fischer, M. Blum**. Univ. of Hohenheim, Stuttgart, Germany

360 B116 Role of KvLQT-1/minK K^+ channel in early embryonic patterning. **J. Morokuma, M. Levin**. Forsyth Center for Developmental and Regenerative Biology, The Forsyth Institute, Boston, MA

Organogenesis

361 B117 Differential expression and alternative splicing of *SoWUSCHEL* is associated with sexual dimorphism in *Spinacia oleracea*. **D. Sather, E.M. Golenberg**. Department of Biological Sciences, Wayne State University, Detroit, MI

362 B118 Abdominal muscle development in marine shrimp. **P.L. Hertzler, W.R. Freas**. Central Michigan University, Mount Pleasant, MI

363 B119 Neurotrophin 3 in the esophageal smooth-to-skeletal muscle transdifferentiation and muscarinic-to-nicotinic acetylcholine receptor transition. **H.E. Angka, B. Kablar**. Dalhousie University, Halifax, NS, Canada

364 B120 Development and differentiation of the visceral smooth muscle cells in vertebrate embryos. **L. Le Guen, P. de Santa Barbara**. Institut de Génétique Humaine, UPR 1142 CNRS, Montpellier, France

365 B121 Sonic and Indian Hedgehog Regulate Intestinal Villus Smooth Muscle Differentiation. **W.J. Zacharias, B.B. Madison, X. Li, A. Kolterud, D.L. Gumucio**. University of Michigan, Ann Arbor, MI

366 B122 Rapamycin-sensitive TOR signaling regulates intestinal growth and morphogenesis in zebrafish. **K. Makky, J. Tekiela, B. Bonacci, A.N. Mayer**. Department of Pediatrics/GI section and Children's Research Institute, Medical College of Wisconsin, Milwaukee, WI

367 B123 SOX9 ectopic expression induces gastric intestinal metaplasia in chicken and humans. **P. de Santa Barbara, G. Granier**. Institut de G?n?tique Humaine, UPR 1142 CNRS, Montpellier, France; Pathology department, Caremeau Hospital, Nimes, France

368 B124 Progressive structural changes in the liver resulting from conditional loss of Notch signaling. **S.S. Huppert**. Vanderbilt University Medical Center, Center for Stem Cell Biology, Nashville, TN

369 B125 Gata6 is an important regulator of mouse pancreas development. **K.J. Decker, L. Sussel**. Univ. of Colorado Health Sciences Center, CO

370 B126 Ngn3 expression in adult pancreas labels a set of precursors that replenish islet mass and function. **A. Zhao, G. Gu**. Vanderbilt University, Medical Center, Nashville, TN

371 B127 Tissue-specific requirements for BMP signaling during thymus and parathyroid morphogenesis. **J. Gordon, N.R. Manley**. Department of Genetics, University of Georgia, Athens, GA

372 B128 TCF4 is required for normal patterning of FGF and BMP signaling and pituitary anlage specification. **M.L. Brinkmeier, M. Potok, S.A. Camper**. Univ. of Michigan, Ann Arbor, MI

373 B129 Wnt genes affect patterning of the ventral diencephalon and pituitary gland growth. **M.A. Potok, K.B. Cha, A. Hunt, M.L. Brinkmeier, A. Kispert, S.A. Camper**. Univ. of Michigan, Ann Arbor, MI; Institut fur Humangenetik, Gottingen, Germany

374 B130 EGF and BMP Inhibition of Fungiform Papilla Formation in Embryonic Tongue. **H. Liu, Y. Zhou, B. Henson, N.J. D'Silva, C. Mistretta**. Sch. of Dentistry, Univ. of Michigan, Ann Arbor, MI

375 B131 Zebrafish lateral line neuromasts respond to chemical stimulation: activation can be optically imaged in the embryo. **A. Majumder, A. Sornborger, C. Keith, J. Lauderdale**. Dept of Celllular Biology, Univ of Georgia, Athens; Faculty of Engineering, Univ of Georgia, Athens

376 B132 Synaptic Ribbon Formation during Xenopus Inner Ear Organogenesis. **M.M. Morales, E.E. Serrano**. New Mexico State University, Las Cruces, NM

377 B133 *GLI3* and Sonic hedgehog regulate hair cell formation and auditory function in mice and humans. **E.C. Driver, S.P. Pryor, P. Hill, J. Turner, U. Rüther, L.G. Biesecker, A.J. Griffith, M.W. Kelley**. NIDCD, NIH, Bethesda, MD; NIDCD, NIH, Rockville, MD; Heinrich-Heine University, D?sseldorf, Germany; NHGRI, NIH, Bethesda, MD

378 B134 A transcriptional network controlling male sensory organ development in *C. elegans*. **W.H. Chan, S.Y. Yip, A.W. Cheng, K.L. Chow**. Hong Kong University of Science and Technology, Hong Kong

379 B135 BMP signaling mediates proper formation of the pronephric kidney in *Xenopus laevis*. **C.M. Bracken, K. Mizeracka, K.A. McLaughlin**. Tufts University, Medford, MA

380 B136 The Role of Bicaudal-C in *Xenopus* Pronephros Development. **O. Wessely, U. Tran**. LSU Health Sciences Center, New Orleans, LA

381 B137 Using zebrafish to study the cellular and molecular defects in renal cystic disease. **J. Sullivan-Brown, R.D. Burdine**. Princeton University

382 B138 Origin of the penile urethra and the proximodistal fate of the urethral epithelium. **A.W. Seifert, B. Harfe, M.J. Cohn**. Department of Zoology, Univ. of Florida, Gainesville, FL; Department of Molecular Genetics and Microbiology, Univ. of Florida, Gainesville, Fl

383 B139 Gata3 is an important regulator of nephric system development. **D. Grote, A. Souabni, M. Busslinger, M. Bouchard**. McGill Univ., Montreal, Quebec; Research Institute of Molecular Pathology, Vienna, Austria

384 B140 Bmp4 Is Required For The Initiation of Tracheal Development. **Y. Li, J. Gordon, Y. Litingtung, N.R. Manley, C. Chiang**. Vanderbilt Univ., Nashville, TN; Univ. of Georgia, Athens, GA

385 B141 Dicer function is essential for lung epithelium morphogenesis. **X. Sun, Z. Zhang, M.T. McManus, B.D. Harfe, K.S. Harris**. Univ. Wisconsin, Madison, WI; Univ. California, San Francisco, CA; Univ. Florida, Gainesville, FL

386 B142 Dissection of MAP kinase signaling in mouse lung branching morphogenesis. **Y. Liu, L. Martinez, M.K. Abe**. Univ. of Chicago, IL

387 B143 Lmp4 regulates Tbx5 during zebrafish heart development. **T. Camarata, J. Topczewski, H. Simon**. Northwestern University, Children's Memorial Research Center, Feinberg School of Medicine, Chicago, IL

388 B144 The Megakaryocyte Lineage Originates From Hemangioblast Precursors During Gastrulation And Is An Integral Component Of Primitive And Definitive Hematopoiesis. **J.M. Tober, A.D. Koniski, R. Vemishetti, R.L. Emerson, K.E. McGrath, R. Waugh, J. Palis**. Center for Pediatric Biomedical Research; Univ. of Rochester; Dept. of Biomedical Engineering; Univ. of Rochester

389 B145 Complexity of Murine Yolk Sac Hematopoiesis. **K.E. McGrath, T.M. Joanna, K.D. Anne, K.D. Paul, P. James**. Center for Pediatric Biomedical Research, Dept. Pediatrics, Univ. of Rochester Medical Center

390 B146 Morphogen or Mitogen? Re-evaluating how Sonic Hedgehog functions in the developing limb. **J. Zhu, M. Nguyen, E. Nakamura, S. Mackem**. Lab. of Pathology, NCI, NIH, Bethesda, MD

391 B147 CtBP2 is expressed in developing joints of murine limb. **J.C. Shambaugh, M.R. Lundeberg**. Goucher College, Baltimore, MD

392 B148 BMP signaling is required for limb bud mesenchyme survival. **S. Pajni-Underwood, Y. Mishina, T. Williams, M. Lewandoski**. NCI-Frederick/NIH; NIES/NIH, Research Triangle NC; University of Colorado, Denver CO

393 B149 bHLH transcription factor regulation of vertebrate limb pattern. **E. Laufer, D. Krawchuk, S. Weiner, P. Riccio, S. Giorgianni**. Columbia University, New York, NY

394 B150 Knockdown of alpha-1-microglobulin bikunin precursor (AMBP) causes ocular, and craniofacial defects. **B.R. Bill, A. DeLuca, B. Warman, J.D. Larson, S.C. Ekker, L.A. Schimmenti**. University of Minnesota, Minneapolis, MN

395 B151 Adhesion ligand nanopatterning influences differentiation of preosteoblast cells: a combined experimental and computational approach. **W.A. Comisar, N.H. Kazmers, D.J. Mooney, J.J. Linderman**. University of Michigan, Ann Arbor, MI; Harvard University, Boston, MA

396 B152 N terminal variation in zebrafish calcium channel beta subunit genes. **D.M. Garrity, A.M. Ebert, A.V. Handschy, T.N. Reynolds, W.A. Horne**. Colorado State University, Fort Collins, CO

Germ Cells and Gametogenesis

397 B153 Identification of dominant suppressors of the *fog-1(q253ts)* allele. **K.R. Douglas, M.E. Bychowski, K.S. Nelson**. Augustana College, Rock Island, IL

398 B154 BMP signaling within the urogenital ridges supports PGC survival and migration. **K. Molyneaux, B. Dudley, J. Nalepka**. Case Western Reserve University, Cleveland, OH

399 B155 Targeting GLH function in *C. elegans* P granules. **E.L. Racen, K.L. Bennett**. University of Missouri Columbia, MO

400 B156 Dynamic RNP aggregates in *C. elegans* oocytes. **J. Bickel, M. Czerwinski, S. Fausett, E. Petty, J. Mason, J. Konwerski, J. Schisa**. Central Michigan University Mount Pleasant, MI

401 B157 A role for the *Drosophila* Toll-like receptor, *18-wheeler*, in ovarian follicle cell migration. **D.A. Siler, C.D. Kleve, M.M. Alpuerto, E.D. Eldon**. California State Univ., Long Beach, CA

402 B158 What Factors Mediate Sperm Pairing in Monodelphis domestica? **Y.P. Cruz, M.M. Sasaki, A. Chock, E. Perloff, E.S. Bedzra, J.E. Pokusa**. Oberlin College, Oberlin, OH

403 B159 TSGA10 expression during embryogenesis and neural development in parallel of spermatogenesis and malignancies. **B. Behnam, V. Conti, A. Puliti, J. Wolfe**. The Galton Laboratory, Department of Biology, University College London, United Kingdom; Dipartimento di Pediatria e CEBR, Université di Genova, Laboratorio di Genetica Molecolare, Istituto G. Gaslini Largo G. Gaslini 5, Genova, Italy

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